THE FAUNA OF INDIA

INCLUDING

PAKISTAN, CEYLON, BURMA AND MALAYA

PUBLISHED UNDER THE PATRONAGE OF THE GOVERNMENT OF INDIA

EDITED BY LT.-COL. R. B. SEYMOUR SEWELL
C.I.E., Sc.D., F.R.S., I.M.S. (Retd.)

ANNELIDA

POLYCHAETA

BY

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CONTENTS

	Page
Editor's Preface	i
Systematic Index	v
Introduction:	1
Morphology	3
Reproduction	10
Habits	11
Geographical Distribution	12
Collection and Preservation	13
Classification	15
Systematic Account	23
Bibliography	479
Alphabetical Index	499

EDITOR'S PREFACE

At its inception the series of volumes that were to be included under the title "The Fauna of British India" was limited to seven, which were to deal with the Vertebrata only. On the recommendation of the then Government of India the Secretary of State for India sanctioned the preparation of these volumes in 1883; but the first volume to be published, that on the Mammalia by W. T. Blanford, F. R. S., did not appear till 1888.

The geographical limits of the fauna to be studied were defined in the preface to this first volume as comprising " the dependencies of India, with the addition of Ceylon, which, though British, is not under the Indian Government. Within the limits thus defined are comprised all India proper and the Himalayas, the Punjab, Sind, Baluchistan, all the Kashmir territories, with Gilgit, Ladak, etc., Nepal, Sikkim, Butan, and other Cis-Himalayan States, Assam, the countries between Assam and Burma, such as the Khasi and Naga hills, and Manipur, the whole of Burma, with Karennee, and, of course, Tenasserim and the Mergui Archipelago, and lastly the Andaman and Nicobar Islands. Afghanistan, Kashgaria, Tibet, Yunnan, Siam, and the Malay Peninsula south of Tenasserim are excluded ".

When the volumes dealing with the Vertebrata were completed the series was extended to include the Lepidoptera and thereafter the Insecta in general. A few years later it was realised that the series was in danger of becoming overloaded with works on the insects to the almost complete exclusion of all the other groups of animals, the only exception being the Arachnida, which were reported on by the late R. I. Pocock, F.R.S., in 1900. In 1908 the first of a series of volumes on the Mollusca was published and this was followed at intervals by three other volumes on this group. In 1909 the sanction of the Sec-

retary of State for India was granted for the preparation of volumes on the Freshwater Sponges, Hydroids and Polyzoa by the late Dr. Annandale, and on Leeches by Mr. Harding and Prof. J. Percy Moore. In the same year it was decided to extend the series so as to include the marine fauna of the Indian coasts, and sanction was accorded for the preparation of two volumes on the Brachyura by the late Lieut.-Col. Alcock, F.R.S.; but Alcock's retirement from India and pressure of work in other spheres prevented the preparation of these volumes. In 1922 the Secretary of State for India was asked to sanction the preparation of a volume on the Madreporarian Corals, but he decided for financial reasons to postpone for a time consideration of any further volumes in the 'Fauna' series.

When the consideration of further volumes was again taken up the marine fauna was not lost sight of and sanction was granted by the Secretary of State for India for the preparation of several volumes on groups of the marine fauna, and with the steady growfh ot our knowledge of the deep-sea fauna of Indian seas it was decided that this should be included, thus widening very considerably the scope of such volumes. The volumes on the marine fauna, that have up to the present time been sanctioned, are:—

Sponges	by M. Burton.
Echinoidea	by Th. Mortensen.[1]
Polychaeta	by P. Fauvel.
Cirripedia	by C. A. Nilsson-Cantell.
Copepoda Calanoida	by R. B. Seymour Sewell.
Brachyura, Oxyrhyncha	by B. N. Chopra.
and Pelecypoda	by Baini Prashad.

The preparation of a 2nd Edition of the volumes on Fishes was also entrusted to Dr. S. L. Hora.

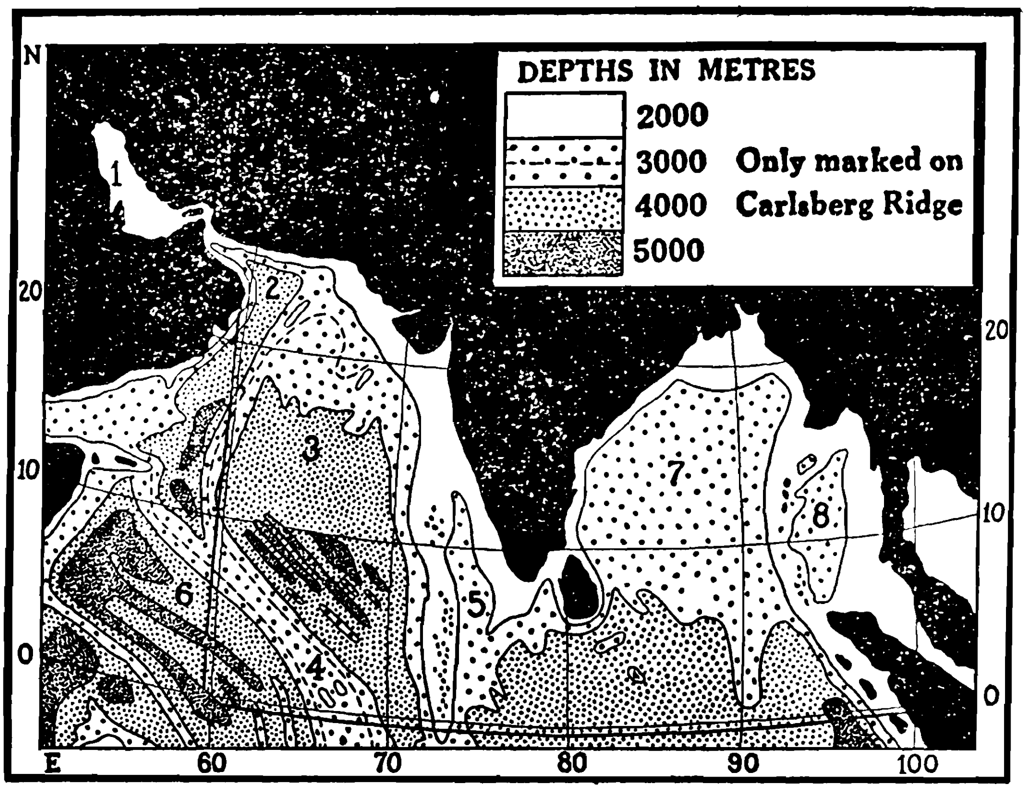
With the extension of the series to include the deep-water fauna it has become necessary to define the boundaries of the ocean within which the fauna may be con-

[1] The death of Dr. Mortensen, since this was written, has rendered the authorship of this volume vacant.

sidered to belong to Indian waters and the following limits have been accepted :—

On the west the area shall be bounded by the meridian of lat. 60°E. as far north as Ras-al-Had, and thus includes the Gulf of Oman and the Persian Gulf.

On the south by the latitude 1°S. so as to include the whole of the Maldive Archipelago.



On the east by the coast of Burma, by a line drawn from Victoria Point to the northern tip of Sumatra and by the west coast of Sumatra as far south as Lat. 1° S.

The area thus enclosed is shown in the accompanying map, which also indicates the various sub-marine ridges and basins that lie wholly or in part within the boundaries of the Indian region. It is, of course, well known that this area is populated by an Indo-Pacific fauna and hence a certain amount of latitude must be granted to Authors who wish, for one reason or another, to include in their account of the Indian fauna certain species that up to the present time have not been captured within these waters but whose presence there may confidently be expected, and this is all the more necessary

since the land region has now been extended beyond the original scope to include Malaya, where this is possible.

As a consequence of the recent change in the Government of India and the division of this region into two new Dominions of India and Pakistan it has become necessary to change the title of the series. In future the series will be known as "The Fauna of India", and the Government of India have decided that the area to be covered shall include India, Pakistan, Ceylon, Burma and, if possible, Malaya. It has also been decided that henceforth the volumes of the series shall be printed in India. The present volume thus becomes the first of a new series.

Acknowledgment and the thanks of both Author and Editor of this volume are due to a number of Scientific Societies and other bodies for permission to reproduce illustrations that have previously been included in the Journals and Memoirs published by them. First and foremost among these is Dr. Chopard and the " Federation Francaise des Sociétés de Sciences Naturelles ", to whom we are indebted for permission to reproduce a large number of figures from Dr. Fauvel's Monographs on the " Polychètes errantes " and " Polychètes sédentaires " in the " Fauna de France ": Other scientific bodies, to whom our thanks are due, are the Trustees of the British Museum (Natural History), the Royal Society of London, the Linnean Society of London, the Zoological Society of London, the Museum d'Histoire Naturelle de Paris and the Société Zoologique de France, and to Messrs. Taylor and Francis, the Publishers of the "Annals and Magazine of Natural History " Finally, our thanks are tendered to the Director of the Zoological Survey of India for permission to reproduce many figures that have been published in the " Records " and " Memoirs of the Indian Museum "

R.B.Seymour Sewell
Editor

The Zoological Laboratory
Cambridge, England

SYSTEMATIC INDEX

ANNELIDA POLYCHAETA

PAGE

ERRANTIA.

I. Fam. *Aphroditidae* Savigny. 23
Subfam. *Hermioninae* Grube 23
Gen. *Aphrodita* Linn. 24
1. *aculeata* Linn. .. 24
2. *australis* Baird. .. 26
3. *talpa* Quatrefages. 26
Gen. *Aphrogenia* Kinberg. 27
1. *alba* Kinberg.. . 27
Gen. *Hermione* Blainville. 28
1. *hystrix* (Savigny). 28
Gen. *Laetmatonice* Kinberg. 29
1. *producta* McIntosh
var. *benthaliana* McIntosh 29
Gen. *Pontogenia* Claparède. 29
1. *indica* Grube. 29
2. *nuda* Horst. ... 30
Subfam. *Polynoinae* Grube. 31
Gen. *Iphione* Kinberg. 32
1. *muricata* Savigny. 32
Gen. *Lepidonotus* Leach. 33
1. *carinulatus* Grube. 34
2. *jacksoni* Kinberg. 34
3. *cristatus* Grube. 35
4. *hedleyi* Benham. 35
5. *dictyolepis* Haswell. 35
6. *tenuisetosus* (Gravier). 36
7. *melanogrammus* Haswell 37
Subgen. *Thormora* (Baird)... 37
1. *jukesi* (Baird).. .. 37
Incertae sedis
1. *Lepidonotus fusicirrus* (Schmarda)... 38
Gen. *Hermenia* Grube. 38
1. *acantholepis* (Grube). 38
Gen. *Eunoë* Malmgren. 39
1. *pallida* (Ehlers). ... 39
Gen. *Gattyana* McIntosh. 39
1. *deludens* Fauvel. .. 39
Gen. *Lagisca* Malmgren. 41
1. *flaccida* Potts. .. 41
Gen. *Harmothoë* Kinberg. 42
1. *imbricata* (Linn). 42
2. *ampullifera* (Grube). 43
3. *dictyophora* (Grube). 44
4. *minuta* (Potts). .. 45
5. *arabica* Monro. 46
6. *indica* (Kinberg)..... 47
7. *boholensis* (Grube). .. 47

PAGE

Incertae sedis.
1. *sinagawensis* (non Izuka) Fauvel. 48
Gen. *Scalisetosus* McIntosh. 49
1. *pellucidus* Ehlers. .. 49
2. *longicirrus* (Schmarda). 50
Gen. *Gastrolepidia* Schmarda 51
1. *clavigera* Schmarda. 51
Gen. *Hyperhalosydna* Augener.. .. 52
1. *striata* (Kinberg). 52
Gen. *Almaniella* McIntosh. 53
1. *ptycholepis* (Grube). 53
Gen. *Admetella* McIntosh. 53
1. *longipedata* McIntosh. 54
Gen. *Drieschia* Michaelsen. 54
1. *pelagica* Michaelsen.. 54
Gen. *Nectochaeta* Marenzeller 55
1. *grimaldii* Marenzeller. 56
Gen. *Lepidasthenia* Malmgren. 56
1. *microlepis* Potts. 57
2. *maculata* Potts. 58
var. *striata* Fauvel. 58
Gen. *Hololepidella* Willey. 59
1. *commensalis* Willey. 59
Subfam. *Sigalioninae* Grube. 60
Gen. *Sthenelais* Kinberg. .. 61
1. *boa* (Johnston). 61
2. *zeylanica* Willey. 62
3. *variabilis* Potts. 62
4. *calcarea* Potts. 64
Gen. *Euthalanessa* Darboux .64
1. *djiboutiensis* (Gravier). 64
Gen. *Eusigalion* Augener. 66
1. *stylolepis* (Willey). 66
Gen. *Psammolyce* Kinberg. 66
1. *fijiensis* McIntosh. 67
2. *antipoda* (Schmarda). 67
3. *zeylanica* Willey 68
Gen. *Leanira* Kinberg.. 69
1. *japonica* McIntosh. . 69
Subfam. *Acoetinae* Grube. .. 70
Gen. *Polyodontes* Renier.. 70
1. *maxillosus* Ranzani. 71
2. *melanonotus* (Grube). 72
Gen. *Panthalis* Kinberg. 74
1. *oerstedi* Kinberg. 74
Gen. *Eupanthalis* McIntosh. 75
1. *edriophthalma* (Potts). 76

	PAGE
II. Fam. *Pisionidae* Levinsen..	76
Gen. *Pisione* Grube........	76
1. *oerstedi* Grube........	77
III. Fam. *Chrysopetalidae* Ehlers..................	78
Gen. *Chrysopetalum* Ehlers..	78
1. *ehlersi* Gravier.........	78
Gen. *Bhawania* Schmarda...	79
1. *cryptocephala* Gravier..	79
IV. Fam. *Amphinomidae* Savigny..................	80
Gen. *Amphinome* Bruguière.	81
1. *rostrata* (Pallas)	81
Gen. *Eurythoë* Kinberg....	82
1. *complanata* (Pallas)...	83
2. *matthaii* Bindra.......	84
3. *parvecarunculata* Horst.	85
Gen. *Pseudeurythoë* Fauvel.	85
1. *paucibranchiata* Fauvel.	86
2. *microcephala* Fauvel...	88
3. *acarunculata* Monro...	89
4. *ambigua* Monro........	90
Gen. *Paramphinome* Sars...	91
1. *indica* Fauvel.........	91
Gen. *Benthoscolex* Horst...	93
1. *caecus* Horst..........	93
Gen. *Chloeia* Savigny......	94
1. *violacea* Horst........	95
2. *flava* (Pallas).........	96
3. *parva* Baird...........	96
4. *amphora* Horst........	96
5. *fusca* McIntosh	97
6. *rosea* Potts...........	97
Gen. *Notopygos* Grube......	98
1. *gigas* Horst...........	98
2. *labiatus* McIntosh.....	99
3. *hispidus* Potts.........	100
4. *variabilis* Potts.......	100
Gen. *Euphrosyne* Savigny....	101
1. *myrtosa* Savigny.......	101
2. *foliosa* Aud. and M.-Edwards..............	102
V. Fam. *Hesionidae* Grube....	103
Gen. *Hesione* Savigny......	103
1. *pantherina* Risso......	104
2. *genetta* Grube.........	105
3. *intertexta* Grube.......	105
Gen. *Leocrates* Kinberg....	105
1. *claparedii* (Costa).....	106
2. *diplognathus* Monro....	107
Gen. *Leocratides* Ehlers....	107
1. *ehlersi* (Horst)........	107
Gen. *Podarke* Ehlers........	108
1. *angustifrons* (Grube)..	109
2. *latifrons* (Grube)......	110
Gen. *Ancistrosyllis* McIntosh	110
1. *rigida* Fauvel........	110
2. *constricta* Southern....	111
Incertae sedis.	
Gen. *Talehsapia* Fauvel....	112
1. *annandalei* Fauvel.....	113
VI. Fam. *Phyllodocidae* Grube.	114
Subfam. *Phyllodocinae*......	115
Gen. *Phyllodoce* Savigny...	115
1. *castanea* (Marenzeller)..	115
2. *quadraticeps* Grube....	116
3. *malmgreni* Gravier...	117
4. *gracilis* Kinberg.......	117
5. *fristedti* Bergström.....	118
Incertae sedis.	
1. *zeylanica* Willey.......	119
Subgen. *Anaitides* Czerniavsky	119
1. *dissotyla* Willey.......	119
2. *madeirensis* Langerhans	120
3. *tenuissima* (Grube)...	121
Gen. *Eulalia* Oersted.......	122
1. *viridis* (Muller).......	122
2. *albo-picta* Marenzeller..	123
Subgen. *Pterocirrus* Claparède	124
1. *magalhaensis* Kinberg..	124
Subgen. *Eumida* Malmgren..	125
1. *sanguinea* Oersted.....	125
Gen. *Notophyllum* Oersted..	126
1. *splendens* (Schmarda)..	126
Gen. *Eteone* Savigny.......	127
1. *barantollae* Fauvel.....	127
2. *ornata* Grube.........	128
Gen. *Paralacydonia* Fauvel..	128
1. *weberi* Horst..........	129
Gen. *Lopadorhynchus* Grube	130
1. *uncinatus* Fauvel......	130
Gen. *Pelagobia* Greeff......	131
1. *longicirrata* Greeff.....	131
VII. Fam. *Alciopidae* Ehlers..	132
Gen. *Asterope* Claparède....	132
1. *candida* (Delle Chiaje).	132
Gen. *Alciopa* Aud. and M.-Edw................	133
1. *cantrainii* (Della Chiaje)	134
Gen. *Vanadis* Claparède....	135
1. *formosa* Claparède....	135
Gen. *Greeffia* McIntosh....	135
1. *celox* (Greeff).........	135
Gen. *Corynocephalus* Levinsen...............	137
1. *albomaculatus* Levinsen.	137

PAGE
Gen. *Rhynchonerella* Costa.. 137
1. *fulgens* Greeff......... 138

VIII. Fam. *Typhoscolecidae* Uljanin.............. 139
Gen. *Travisiopsis* Levinsen.. 139
1. *lobifera* Levinsen...... 139

IX. Fam. *Tomopteridae* Grube 140
Gen. *Tomopteris* Eschscholtz 140
Subgen. *Tomopteriss.* str.... 140
1. *mortenseni* Augener.... 141
2. *cavallii* Rosa......... 141
3. *elegans* Chun......... 142
4. *planktonis* Apstein..... 142
Subgen. *Johnstonella* Gosse.. 142
1. *helgolandica* Greeff.... 143
2. *rolasi* Greeff.......... 143
3. *ducii* Rosa............ 143
4. *aloysi-sabaudiae* Rosa.. 144
5. *dunkeri* Rosa......... 145

X. Fam. *Syllidae* Grube........ 145
Gen. *Syllis* Savigny......... 146
Subgen. *Haplosyllis*
1. *spongicola* Grube...... 147
Subgen. *Syllis* s. str
1. *gracilis* Grube......... 147
Subgen. *Typosyllis*
1. *variegata* Grube........ 148
2. *prolifera* Krohn........ 149
3. *krohnii* Ehlers......... 150
4. *closterobranchia* Schmarda............ 150
5. *exilis* Gravier......... 151
6. *okadai* Fauvel......... 152
Subgen. *Ehlersia* Langerhans
1. *cornuta* (Rathke).... 153
Gen. *Opisthosyllis* Langerhans............. 153
1. *longicirrata* Monro..... 154
2. *brunnea* Langerhans.... 155
3. *australis* Augener...... 156
Gen. *Trypanosyllis* Claparède 156
1. *zebra* Grube........... 157
2. *gigantea* (McIntosh).... 158
3. *misakiensis* Izuka...... 158
Gen. *Eusyllis* Malmgren.... 159
1. *ceylonica* Augener...... 159
Gen. *Odontosyllis* Claparede. 160
1. *gravelyi* Fauvel........ 160
Gen. *Parasphaerosyllis* Monro.................. 162
1. *indica* Monro.......... 162
Gen. *Autolytus* Grube...... 162
1. *orientalis* Willey....... 162

PAGE
Incertae sedis.
1. *Cirrosyllis zealanica* Schmarda............. 163
2. *Pionosyllis* sp. Fauvel.. 163
3. *Exogone* sp. Augener... 163
4. *Sacconereis* sp. Fauvel.. 163

XI. Fam. *Nereidae* Johnston... 163
Gen. *Lycastis* Savigny...... 166
1. *meraukensis* Horst..... 166
2. *indica* Southern....... 167
Gen. *Tylonereis* Fauvel...... 168
1. *bogoyawlenskyi* Fauvel.. 168
2. *fauveli* Southern....... 169
Gen. *Leonnates* Kinberg.... 169
1. *jousseaumei* Gravier.... 169
2. *decipiens* Fauvel...... 171
Gen. *Dendronereis* Peters.... 172
1. *arborifera* Peters...... 172
2. *aestuarina* Southern.... 173
Gen. *Dendronereides* Southern................ 173
1. *heteropoda* Southern... 174
Gen. *Nereis* Cuvier........ 175
Subgen. *Nereis* s. str. Kinberg 177
1. *anchylochaeta* Horst... 177
2. *onychophora* Horst.... 178
3. *chingrighattensis* Fauvel 179
4. *cricognatha* Ehlers..... 180
5. *glandicincta* Southern.. 181
6. *unifasciata* Willey..... 182
7. *trifasciata* Grube....... 183
8. *talehsapensis* Fauvel... 184
9. *chilkaensis* Southern.... 185
10. *indica* Kinberg....... 186
11. *coutierei* Gravier....... 187
12. *zonata-persica* Fauvel.. 187
13. *kauderni* Fauvel...... 188
14. *jacksoni* Kinberg....... 189
15. *reducta* Southern...... 190
16. *gisserana* Horst....... 190
17. *longilingulis* Monro.... 192
18. *heteromorpha* Horst... 193
Subgen. *Neanthes* Kinberg.. 193
1. *capensis* Willey........ 193
2. *megittii* Monro....... 194
Subgen. *Ceratonereis* Kinberg. 194
1. *costae* Grube.......... 194
2. *pachychaeta* Fauvel.... 196
3. *burmensis* Monro...... 196
4. *tripartita* Horst....... 197
5. *microcephala* Grube... 198
6. *flagellipes* Fauvel...... 199
7. *mirabilis* Kinberg...... 200
Gen. *Perinereis* Kinberg.... 202
1. *maindroni* Fauvel.... 203
2. *barbara* Monro........ 204

	PAGE
3. *suluana* Horst. ..	204
4. *singaporiensis* Grube.	205
5. *vancaurica* (Ehlers).	205
6. *cultrifera* Grube.	206
var. *typica* Grube.	208
var. *floridana* Ehlers.	208
var. *perspicillata* Grube	208
var. *helleri* Grube.	208
var. *striolata* Grube.	209
7. *aibuhitensis* Grube. ..	209
8. *nigro-punctata* Horst.	210
9. *cavifrons* Ehlers.	210
10. *neocaledonica* Pruvot.	211
11. *nuntia* (Savigny).	212
var. *typica* (Savigny).	213
var. *brevicirris* (Grube).	214
var. *heterodonta* Gravier. . .	214
var. *vallata* Grube.	215
Gen. *Pseudonereis* Kinberg.	215
1. *gallapagensis* Kinberg.	215
2. *anomala* Gravier.	217
3. *rottnestiana* Augener.	217
Gen. *Platynereis* Kinberg.	217
1. *dumerilii* (Aud. and M.-Edw.).. .. .	218
2. *fusco-rubida* Grube.	219
3. *pulchella* Gravier.. ..	220
4. *polyscalma* Chamberlin	221
5. *abnormis* (Horst).	222
Incertae sedis.	
1. *Nereis* sp. m. *ezoensis* Izuka, Gravely.	223
2. *Nereis ehlersiana* Grube, Willey.. ..	223
3. *Nereis festiva* Grube. ..	223
4. *Nereis foliosa* Schmarda	223
5. *Nereis* sp. Fauvel.	223
XII. Fam. *Nephthydidae* Grube	223
Gen. *Nephthys* Cuvier. ..	223
1. *inermis* Ehlers.	224
2. *dibranchis* Grube.	225
3. *gravieri* Augener.	226
4. *malmgreni* Theel.	226
5. *polybranchia* Southern.	227
6. *oligobranchia* Southern.	228
Incertae sedis.	
1. *Nephthys dussumieri* Valenciennes.	228
XIII. Fam. *Eunicidae* Grube.	228
Subfam. *Eunicinae* Kinberg.	230
Gen. *Eunice* Cuvier....	231
1. *tubifex* Crossland.	232
2. *aphroditois* (Pallas).	233
3. *tentaculata* Quatrefages.	234

	PAGE
4. *floridana* Pourtales.	235
5. *afra* Peters.... ...	235
var. *paupera* Grube.	236
6. *coccinea* Grube.	236
7. *grubei* Gravier..	237
8. *savignyi* Grube. .	238
9. *investigatoris* Fauvel.	239
10. *antennata* Savigny.	240
11. *australis* Quatrefages.	240
12. *indica* Kinberg.	241
13. *siciliensis* Grube.	241
14. *marenzelleri* Gravier.	242
15. *gracilis* Crossland.	243
Gen. *Marphysa* Quatrefages.	244
1. *sanguinea* Montagu.	245
2. *macintoshi* Crossland.	246
3. *gravelyi* Southern.	246
4. *mossambica* Peters.	246
5. *stragulum* Grube.	247
6. *fallax* Marion and Bobretzky.... ..	247
Gen. *Paramarphysa* Ehlers.	247
1. *orientalis* Willey.	247
Gen. *Lysidice* Savigny.	248
1. *collaris* Grube...	248
Gen. *Nematonereis* Schmarda	249
1. *unicornis* Grube..	249
Subfam. *Lysaretinae* Kinberg.	250
Gen. *Aglaurides* Ehlers.	250
1. *fulgida* (Savigny).	250
Subfam. *Onuphidinae* Levinsen.	251
Gen. *Diopatra* Aud. and M.-Edw..	251
1. *neapolitana* Delle Chiaje	252
Gen. *Onuphis* Aud. and M.-Edw.....	253
1. *dibranchiata* Willey.	254
2. *furcatosetosa* Monro.	254
3. *conchylega* Sars.	255
4. *holobranchiata* Marenzeller.. ..	256
5. *aucklandensis* Augener.	257
6. *eremita* Aud. and M.-Edw..	257
7. *investigatoris* Fauvel.	258
Gen. *Hyalinoecia* Malmgren	260
1. *tubicola* (O. F. Müller)	261
Ehlers.	261
Gen. *Rhamphobrachium* Ehlers	
1. *chuni* Ehlers. .	261
2. *diversosetosum* Monro.	262
Subfam. *Lumbriconereinae* Grube.... .. .	263
Gen. *Lumbriconereis* Blainville.	263

PAGE
1. *simplex* Southern. .. 264
2. *polydesma* Southern. 264
3. *latreilli* Aud. and M.-Edw...... 266
4. *sphaerocephala* Schmarda... .. 267
5. *impatiens* Claparède. 267
6. *heteropoda* Marenzeller 268
7. *bifilaris* Ehlers. . . 269
8. *pseudobifilaris* Fauvel. 269
9. *notocirrata* Fauvel. 271
Gen. *Arabella* Grube. 274
1. *iricolor* (Montagu)... 274
2. *mutans* (Chamberlin). 275
Gen. *Drilonereis* Claparède. 276
1. *filum* Claparède. .. 276
2. *major* Crossland. 277
Gen. *Ninoë* Kinberg. 277
1. *chilensis* Kinberg. 277
Subfam. *Staurocephalinae* Kinberg. 278
Gen. *Staurocephalus* Grube.. 278
1. *incertus* (Schmarda). 279
2. *gardineri* Crossland. 280
Incertae sedis
1. *Eunice teretiuscula* Schmarda. 280
2. *Diopatra phyllocirra* Schmarda..... .. 281
3. *Diopatra malabarensis* Quatrefages. . 281
4. *Tradopia maculata* Baird. . 281
5. *Notocirrus trigonoce—phalus* Schmarda... 281
6. *Lumbriconereis indica* Kinberg. 281

XIV. Fam. *Glyceridae* Grube. 281
Subfam. *Goniadinae* Arwidsson 281
Gen. *Goniada* Aud. and M.-Edw . 282
1. *emerita* Aud. and M.-Edw.. 282
2. *annulata* Moore. 283
3. *eximia* Ehlers. . 285
Subgen. *Goniadopsis* Fauvel. 285
1. *incerta* Fauvel. 286
2. *agnesiae* Fauvel. 287
Gen. *Glycinde* Müller. 288
1. *oligodon* Southern.. 288
Subfam. *Glycerinae* Arwidsson 289
Gen. *Glycera* Savigny. 290
1. *tesselata* Grube. ... 291
2. *lancadivae* Schmarda. 291
3. *longipinnis* Grube. 291
4. *alba* Rathke. 292

PAGE
5. *prashadi* Fauvel. .. 294
6. *sagittariae* McIntosh. 295
7. *gigantea* Quatrefages. 296
8. *rouxii* Aud. and M.-Edw. . 297
9. *cirrata* Grube. 297
10. *manorae* Fauvel. 298

SEDENTARIA.. 300
XV. Fam. *Ariciidae* Aud. and M.-Edw.. 300
Gen. *Aricia* Savigny. 300
1. *cuvieri* Aud. and M.-Edw.. . 301
var. *persica* Fauvel. 302
2. *nuda* Moore. 303
3. *exarmata* Fauvel... 304
Gen. *Scoloplos* Blainville. 306
1. *marsupialis* Southern. 306
2. *kerguelensis* McIntosh.. 307
3. *chevalieri* (Fauvel). 308
4. *latus* (Chamberlin). 309
Gen. *Nainereis* Blainville. 310
1. *laevigata* (Grube). 310

XVI. Fam. *Spionidae* Sars. 311
Gen. *Nerine* Johnston..... 312
1. *cirratulus* Delle Chiaje. 312
Gen. *Scolelepis* Blainville. 313
1. *indica* Fauvel.... 313
Gen. *Laonice* Malmgren. 315
1. *cirrata* Sars. 315
Gen. *Polydora* Bose. 315
Subgen. *Carazzia* Mesnil. 316
1. *antennata* Claparède. 316
2. *kempi* Southern. 317
Subgen. *Polydora* Bose. 318
1. *hornelli* Willey. 318
2. *ciliata* Johnston. . 319
3. *coeca* Oersted. 319
4. *armata* Langerhans. 321
5. *flava* Claparède. . 321
Gen. *Polydorella* Augener. 322
1. *prolifera* Augener. 322
Gen. *Prionospio* Malmgren. 323
1. *pinnata* Ehlers. . 323
2. *cirrifera* Wiren. 324
3. *polybranchiata* Fauvel. 324
4. *krusadensis* Fauvel. 326

XVII. Fam. *Disomidae* Mesnil. 327
Gen. *Disoma* Oersted. .. 327
1. *orissae* Fauvel. 327

XVIII. Fam. *Magelonidae* Cunningham and Ramage. 329

PAGE

Gen. *Magelona* (O. F. Müller) 329
1. sp. juv 329

XIX. Fam. *Cirratulidae* Carus .. 329
Gen. *Audouinia* Quatrefages. 330
1. *semicincta* (Ehlers) 330
2. *filigera* (Delle Chiaje) 331
3. *anchylochaeta* (Schmarda) 332
Gen. *Cirratulus* Lamarck ... 332
1. *filiformis* Keferstein ... 333
2. *chrysoderma* Claparède. 333
3. *dasylophius* Marenzeller 333
4. *cirratus* (O. F. Müller) 334
Gen. *Tharyx* Webster and Benedict 334
1. *multifilis* Moore 334
Gen. *Heterocirrus* Grube 334
1. *typhlops* Willey 334
Gen. *Dodecaceria* Oersted .. 335
1. *fistulicola* Ehlers 335

XX. Fam. *Chaetopteridae* Aud. and M.-Edw 336
Gen. *Chaetopterus* Cuvier .. 337
1. *variopedatus* Renier 337
Gen. *Phyllochaetopterus* Grube 338
1. *socialis* Claparède 339
2. *elioti* Crossland 340
3. *gardineri* Crossland 341
4. *aciculigerus* Crossland .. 341
5. *herdmani* Willey 342
Gen. *Mesochaetopterus* Potts 342
1. *minutus* Potts 342

XXI. Fam. *Chloraemidae* Malmgren 344
Gen. *Flabelligera* Sars 344
1. *diplochaitos* (Otto) 344
Gen. *Stylarioides* Delle Chiaje 345
1. *hamocarens* Monro 345
2. *parmatus* Grube 346
3 *eruca* Claparède, var. *indica* Fauvel 347
4. *bengalensis* Fauvel 347
5. *bifidus* Fauvel 349
Gen. *Brada* Stimpson 351
1. *talehsapensis* Fauvel ... 351
2. *mamillata* Grube 352
Gen. *Diplocirrus* Haase 352
1. *glaucus* (Malmgren) ... 353

PAGE

Incertae sedis
1. *Ilyphagus hirsutus* Monro 354

XXII. Fam. *Scalibregmidae* Malmgren 354
Gen. *Scalibregma* Rathke 354
1. *inflatum* Rathke 355
Gen. *Parasclerocheilus* Fauvel 355
1. *branchiatus* Fauvel 356
Incertae sedis
1. *Oncoscolex microchaetus* Schmarda 357

XXIII. Fam. *Opheliidae* Grube 357
Gen. *Armandia* Filippi 358
1. *lanceolata* Willey 358
2. *leptocirris* (Grube) 385
Gen. *Ammotrypane* Rathke. 359
1. *aulogaster* Rathke 359
Gen. *Polyophthalmus* Quatrefages 359
1. *pictus* (Dujardin) 360
Gen. *Travisia* Johnston 361
1. *arborifera* Fauvel 361

XXIV. Fam. *Capitellidae* Grube 362
Gen. *Notomastus* Sars 363
1. *latericeus* Sars 364
2. *giganteus* Moore 365
Gen. *Dasybranchus* Grube ... 365
1. *caducus* Grube 365
Gen. *Heteromastus* Eisig ... 366
1. *similis* Southern 366
Gen. *Heteromastides* Augener 367
1. *bifidus* Augener 368
Gen. *Paraheteromastus* Monro 368
1. *tenuis* Monro 369
Gen. *Mastobranchus* Eisig .. 369
1. *indicus* Southern 369
Gen. *Barantolla* Southern ... 370
1. *sculpta* Southern 370
Gen. *Capitellethus* Chamberlin 370
1. *dispar* (Ehlers) 371
Gen. *Branchiocapitella* Fauvel 371
1. *singularis* Fauvel 371
Gen. *Scyphoproctus* Gravier. 372
1. *djiboutiensis* Gravier ... 373
Gen. *Pulliella* Fauvel 374
1. *armata* Fauvel 374

PAGE
XXV. Fam. *Arenicolidae* Johnston.............. 375

XXVI. Fam. *Maldanidae* Malmgren.............. 375
Gen. *Clymene* Savigny...... 376
Subgen. *Euclymene* Verrill... 376
1. *annandalei* Southern... 377
2. *insecta* (Ehlers)....... 377
3. *grossa* Baird.......... 378
4. *watsoni* Gravier........ 379
5. *santanderensis* Rioja... 379
Subgen. *Praxillella* Verrill.... 380
1. *gracilis* Sars........... 380
Gen. *Axiothella* Verrill..... 380
1. *obockensis* (Gravier)... 380
2. *australis* Augener...... 381
Gen. *Maldane* Grube...... 382
1. *sarsi* Malmgren....... 382
Gen. *Maldanella* McIntosh.. 383
1. *harai* (Izuka)......... 383
Gen. *Petaloproctus* Quatrefages............. 384
1. *terricola* Quatrefages... 385
Gen. *Asychis* Kinberg...... 385
1. *theodori* Augener...... 386
2. *gotoi* (Izuka)......... 387
3. *disparidentata* (Moore). 387
4. *trifilosa* Augener...... 388
5. *gangeticus* Fauvel..... 389
Incertae sedis
1. *Nicomache truncata* Willey............... 390

XXVII. Fam. *Oweniidae* Rioja 390
Gen. *Owenia* Delle Chiale.. 391
1. *fusiformis* Delle Chiaje. 391
Gen. *Myriochele* Malmgren.. 391
1. *picta* Southern........ 392
Fam. *Sabellariidae* Johnston... 393

XXVIII. Fam. *Sabellariidae* Johnston............... 393
1. *spinulosa* Leuckart.... 394
var. *alcocki* Gravier.... 395
2. *cementarium* Moore.... 395
3. *pectinata* Fauvel...... 396
var. *intermedia* Fauvel 397
Gen. *Pallasia* Quatrefages.. 398
Subgen. *Pallasia* Quatrefages s. str..................398
1. *pennata* Peters........ 398
Subgen. *Lygdamis* Kinberg.. 398
1. *indicus* Kinberg 399
2. *porrectus* Ehlers....... 400

XXIX. Fam. *Sternaspididae* Malmgren.............. 401

PAGE
Gen. *Sternaspis* Otto....... 401
1. *scutata* (Ranzani)..... 401

XXX. Fam. *Amphictenidae* Malmgren.............. 402
Gen. *Pectinaria* Lamarck.... 402
Subgen. *Pectinaria* Lamarck s. str.................. 403
1. *antipoda* Schmarda.... 403
Subgen. *Amphictene* Savigny. 403
1. *crassa* Grube.......... 403
Subgen. *Lagis* Malmgren.... 405
1. *abranchiata* Fauvel.... 405
Incertae sedis
1. *Pectinaria panava* Willey............... 406
2. *Pectinaria capensis* Gmelin............... 406

XXXI. Fam. *Ampharetidae* Malmgren.............. 406
Gen. *Amphicteis* Grube..... 407
1. *gunneri* Sars.......... 407
2. *posterobranchiata* Fauvel............... 408
Gen. *Amage* Malmgren.... 410
1. *bioculata* (Moore)..... 410
Gen. *Schistocomus* Chamberlin............. 411
1. *hiltoni* Chamberlin.... 411
Gen. *Melinopsis* McIntosh.... 412
1. *dubita* (Hoagland).... 412
Gen. *Melinna* Malmgren.... 413
1. *aberrans* Fauvel....... 413

XXXII. Fam. *Terebellidae* Grube................ 415
Subfam. *Amphitritinae* Malmgren.............. 416
Gen. *Loima* Malmgren..... 416
1. *medusa* (Savigny)..... 416
Gen. *Lanice* Malmgren..... 418
1. *socialis* (Willey)...... 418
Gen. *Polymnia* Malmgren.. 418
1. *nebulosa* (Montagu)... 419
Gen. *Nicolea* Malmgren.... 420
1. *gracilibranchis* (Grube) 420
Gen. *Terebella* Linnaeus... 420
1. *ehrenbergi* Grube..... 421
Gen. *Pista* Malmgren...... 422
1. *indica* Fauvel......... 422
2. *typha* Grube.......... 424
3. *robustiseta* Caullery.... 424
4. *fasciata* (Grube)....... 425
5. *macrolobata* Hessle.... 426
6. *herpini* Fauvel........ 427

	PAGE
7. *pachybranchiata* Fauvel....	428
Subfam. *Thelepinae* Hessle.	430
Gen. *Thelepus* Leuckart..	430
1. *plagiostoma* Schmarda.	430
2. *cincinnatus* (Fabricius).	431
Gen. *Streblosoma* Sars.	432
1. *persica* (Fauvel).	432
2. *cespitosa* (Willey).	433
Subfam. *Polycirrinae* Malmgren. . .	434
Gen. *Polycirrus* Grube.	434
1. *coccineus* Grube..	434
Gen. *Lysilla* Malmgren..	435
1. *pambanensis* Fauvel.	435
Subfam. *Canephorinae* Malmgren...	436
Gen. *Terebellides* Sars.	436
1. *stroemi* Sars.	436
Incertae sedis.	
1. *Polymnia labiata* Willey	437
2. *Physelia viridis* Schmarda.... .. .	437
3. *Neottis gracilis* Kinberg	437
XXXIII. Fam. *Sabellidae* Malmgren....	437
Gen. *Sabella* Linnaeus. .	439
1. *porifera* Grube.	439
2. *melanostigma* Schmarda	439
Gen. *Spirographis* Viviani.	440
1. *spallanzanii* Viviani.	441
Gen. *Dasychone* Sars.	442
1. *cingulata* Grube.	442
2. *serratibranchis* Grube.	442
Gen. *Branchiomma* Kölliker.	443
1. *pacificum* (Johansson).	444
2. *intermedium* Beddard.	444
Gen. *Sabellastarte* Kröyer.	445
1. *indica* Savigny..	445
Gen. *Laonome* Malmgren.	446
1. *indica* Southern.	446
Gen. *Hypsicomus* Grube..	447
1. *phaeotaenia* (Schmarda)	447
Gen. *Potamilla* Malmgren.	448
1. *ehlersi* Gravier..	449
2. *leptochaeta* Southern.	449
3. *ceylonica* Augener.	449
Gen. *Jasmineira* Langerhans.	450
1. *caducibranchiata* Willey	451
Gen. *Manayunkia* Leidy. ..	452
1. *spongicola* Southern...	452
XXXIV. Fam. *Serpulidae* Burmeister..	452
Gen. *Serpula* Linnaeus.	454
1. *vermicularis* Linnaeus.	454
var. *granulosa* Marenzeller... .	455
var. *watsoni* Willey.	456
Gen. *Hydroides* Gunnerus.	456
1. *perezi* Fauvel. .	457
2. *homoceros* Pixell.	458
3. *norvegica* (Gunnerus).	458
4. *lunulifera* (Claparède).	458
5. *heteroceros* (Grube).	459
6. *monoceros* Gravier.	460
7. *minax* (Grube).	460
8. *albiceps* (Ehrenberg).	460
9. *exaltatus* (Marenzeller)	461
var. *vesiculosus* Fauvel.	461
Gen. *Pomatoleios* Pixell.	461
1. *crosslandi* Pixell.	461
Gen. *Spirobranchus* Blainville. ..	462
1. *giganteus* (Pallas).. .	462
2. *jousseaumei* (Gravier).	464
3. *maldivensis* Pixell. .	464
Gen. *Pomatostegus* Schmarda	464
1. *stellatus* Abildgaard.	465
2. *polytrema* Philippi.	465
var. *indica* Fauvel.	465
Gen. *Vermiliopsis* Saint-Joseph... ..	465
1. *pygidialis* (Willey).	466
2. *acanthophora* Augener.	467
3. *glandigerus* Gravier.	467
Gen. *Omphalopomopsis* Saint-Joseph.	467
1. *langerhansi* (Marenzeller). . ..	468
Gen. *Pomatoceros* Philippi.	469
1. *caeruleus* (Schmarda).	470
Gen. *Ditrupa* Berkeley..	470
1. *arietina* (O. F. Müller)	470
var. *monilifera* Fauvel.	470
Gen. *Protula* Risso.	471
1. *tubularia* (Montagu).	472
Gen. *Ficopomatus* *Southern*.	473
1. *macrodon* Southern.	473
Gen. *Mercierella* Fauvel.	474
1. *enigmatica* Fauvel.	474
Gen. *Salmacina* Claparède.	476
1. *dysteri* (Huxley).	477
Gen. *Spirorbis* Daudin. ..	477
1. *foraminosus* Moore.	477

POLYCHAETA

INTRODUCTION

Previous to the year 1861 very little was known concerning the Polychaetous Annelids of India.

L. K. Schmarda, in the course of a journey round the world (1853—1857), spent several months collecting in Ceylon and in his Report "Neue wirbellose Thiere" (1859—61) * he described about a score of Polychaeta from that island. Unfortunately Schmarda's descriptions are generally too vague and too scanty to allow of an accurate identification.

In Grube's short paper on the Ceylon Annelids (1874) only six species are described. In W. Michaelsen's "Polychaeten von Ceylon" (1892) fifteen species were recorded.

By far the most important work on the subject is A. Willey's "Report on the Polychaeta collected by Prof. Herdman at Ceylon" (1905) in which a large number of old and new species are described. It was followed by Southern's "Polychaeta of the Chilka Lake" (1921); Augener's "Ceylon Polychaeten" (1926) and "the Littoral Fauna of Krusadai Island, in the Gulf of Manaar;" "Chaetopoda", Part I, by Gravely (1927); Part II by Fauvel (1930).

But all these papers are relative to Ceylon and its vicinity and the coasts of the Madras Presidency. As for the other parts of India, with the exception of S. S. Bindra's "Fauna of Karachi" (1927), only casual mention, here and there, of a few species are scattered in papers not specially dealing with India. But later the collections of the Zoological Survey of India and of the Indian Museum, Calcutta, have afforded us much more extensive knowledge concerning the Polychaeta, not only from the coasts of India but also from the neighbouring Seas. Three hundred species were recorded in Fauvel's Report (1932)

* For full references concerning the papers mentioned see the Index at the end of the volume.

The range of the area dealt with in the present work extends from Long. 60° E, as far as Cape Ras-al-Hadd, on the western side; the whole of the Persian Gulf and the Baluchistan Coast forming the northern boundary; to the east, the region includes the Malacca Strait, as far as Singapore, whilst the Southern boundary is Lat. 1°S, so as to include the whole of the Maldive Archipelago.

On the Persian Gulf, the Arabian Sea, the Gulf of Oman, the Bay of Bengal, the Maldive and Mergui Archipelagoes information as regards the Polychaeta is very plentiful but is scattered in a large number of Reports of various expeditions.

Thus we have been able to record 450 species from the given area. Nevertheless, this rather high number hardly represents more than about one-half of the probable total number of the Polychaeta, for, owing to the well known ubiquity of these worms, nearly every species of the Indian Ocean and of the warm parts of the Pacific is likely to be found in the area of the Indian Fauna, as delimited above.

Having had the good fortune to be able to study three hundred species of the Indian Museum, one hundred and nine of the Madras Government Museum, and the material of several expeditions to the Red Sea, Persian Gulf, Indo-China, New Caledonia, Australia and Gambier Islands, nearly all of the 450 species here described have been in my hands, the few exceptions being some rare ones, the description of which I have taken from the original authors.

The Polychaete Fauna of India does not materially differ from that of the Gulf of Siam, Malay Archipelago, China Sea, Philippines, Great Barrier Reef, Australia, New-Caledonia, and a great part of the Pacific. It must also be borne in mind that many Polychaetes are really cosmopolitan. Out of the 450 species here recorded 108, nearly one-fourth, are also European species.

ANNELIDA POLYCHÆTA

The Polychaeta and the Oligochaeta are two important divisions of the Chaetopoda, annulated worms endowed with locomotive bristles or setae. But the bristles of the Oligochaeta are few and directly set on the body-walls, which are destitute of parapodia or feet. Other appendages are also wanting. On the other hand, the bristles of the Polychaeta are usually very numerous and borne on clearly marked parapodia, lateral expansions, or feet, of the teguments. The body generally carries various appendages such as tentacles, palps, cirri, branchiae, etc. Moreover, the Polychaeta are very generally marine animals with separate sexes, whilst the Oligochaeta live in fresh water or damp earth and are hermaphrodite.

MORPHOLOGY

Fig. 1.

The body is generally elongated, with numerous segments. It consists of a *Prostomium* or anterior cepha-

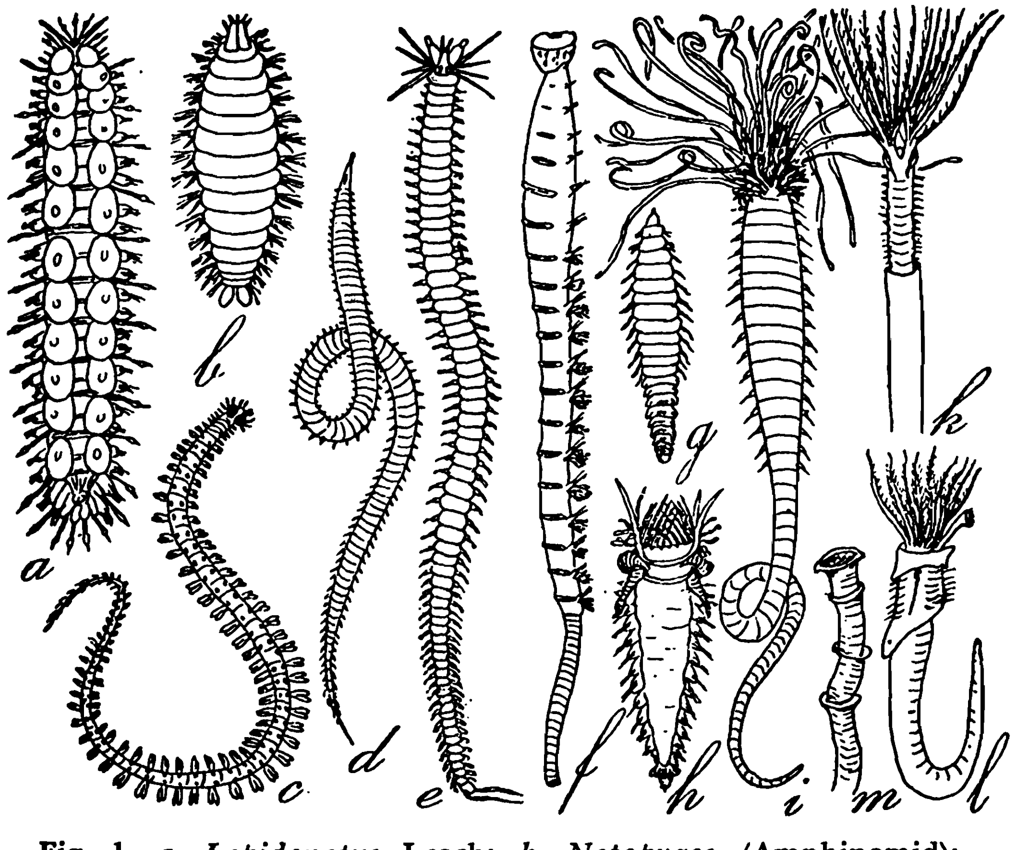


Fig. 1.—*a, Lepidonotus* Leach; *b, Notopygos* (Amphinomid); *c, Callizona* (Alciopid); *d, Glycera* (Glycerid); *e, Nereis; f, Arenicola; g, Travisia* (Opheliid); *h, Pectinaria; i, Terebella; k, Sabella; l, m, Mercierella* and tube (Serpulid).

lic lobe, a *Metastomium* including all the following segments, and a *Pygidium,* the last segment.

A few anterior segments, more or less modified, may be fused with the prostomium to form a kind of head with various appendages such as *antennae* or tentacles, *palps* and *tentacular cirri.*

In the *Errantia,* the segments of the metastomium are often very numerous and nearly all alike, as in the NEREIDAE, SYLLIDAE, EUNICIDAE, etc., whilst in the *Sedentaria* the body, sometimes shorter, is often clearly divided into distinct regions such as thorax, abdomen, and tail.

The prostomium, a cephalic lobe, the anterior part of the so-called head, is sometimes reduced to a mere cone, blunt or sharp, and destitute of any appendages, as in *Lumbriconereis.* It is a long annulated cone, with four small tentacles at the tip, in *Glycera;* square or scute-like in *Nephthys;* more or less complicated with several appendices in Nereids, APHRODITIDAE and EUNICIDAE; or reduced to a mere ridge in Sabellids and Serpulids.

The prostomium generally carries one, two or more pairs of eyes, mere eye-spots, single or compound, or sometimes highly differentiated organs such as the big red eyes of the Alciopids, with a cornea, a lens and a retina.

Appendages (Fig. 2).

The appendages of the Polychaeta are various processes of the teguments which may be classed into two groups. The first are merely epidermic solid projections, as the *styles* and *stylodes.* The others are hollow and are formed by an evagination of the body wall.

When the antennae, palps and cirri are borne on a hollow base, this last is termed '*phore*' Such an antenna is then divided into a solid distal part, or *ceratostyle,* and a basilar hollow part or *ceratophore;* a palp is divided into a *palpostyle* and a *palpophore* a cirrus into a *cirrostyle* and a *cirrophore.*

Amongst the cephalic appendages are: (1) the *palps,* innervated by a large nerve issuing from the anterior part of the brain. They may be simple, elongated, prehensile (SPIONIDAE) or short, simple, or articulate (SYLLIDAE, NEREIDAE); (2) the *antennae* or tentacles, innervated from the middle brain; (3) the tentacular cirri, borne on

the *metastomium* (buccal segment), or on the segments fused with the prostomium to form the head.

The *Parapodia,* or feet, are more or less complicated lateral processes of the body-wall. These organs, with the

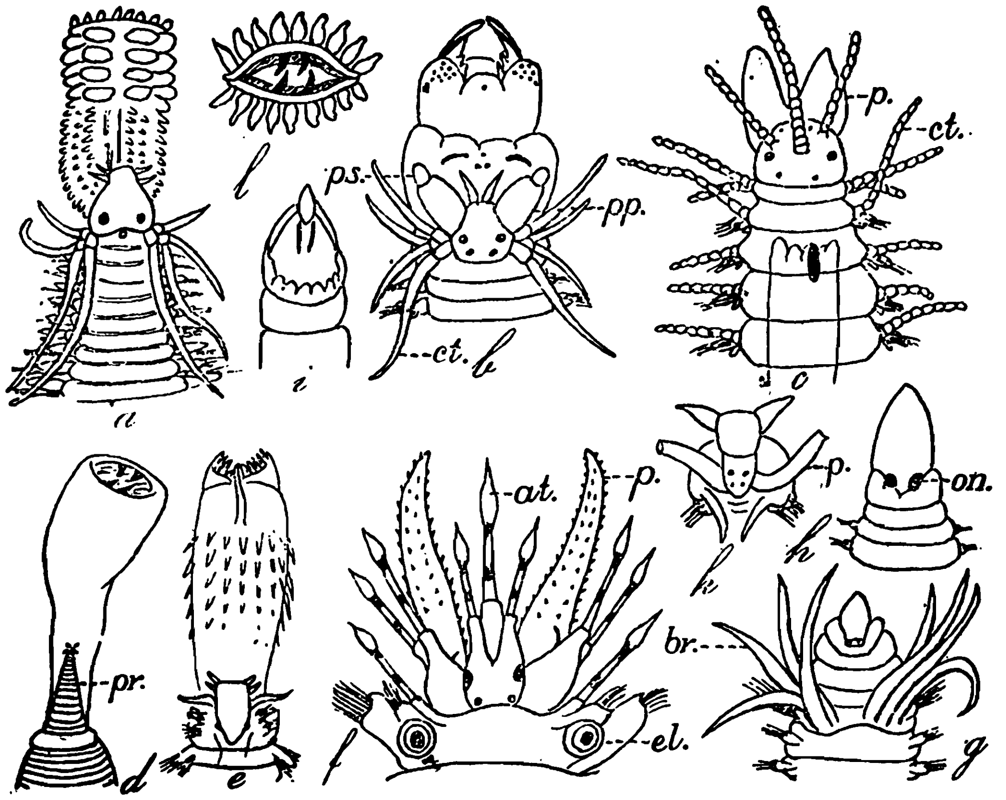


Fig. 2.—*a,* head and proboscis of *Phyllodoce; b,* head of *Nereis; c,* anterior part of *Syllis; d,* of *Glycera; e,* of *Nephthys; f,* of *Lepidonotus; g,* of *Ampharete; h,* of *Lumbriconereis; i,* of *Clymene; k,* of *Nerine; l,* proboscis of a Polynoid, front view with papillae and jaws (*at,* tentacles; *br.* gills; *ct,* tentacular cirri; *el,* elytrophore; *p,* palps; *pp,* palpophores; *pr,* prostomium; *on,* nuchal organs).

bristles they carry, provide the most important features for the identification of the species. Typically, each segment carries one pair of parapodia divided into two *rami,* a dorsal one, or *notopodium,* and a ventral or *neuropodium.* When both rami are borne on a common base the biramous foot is said to be monostichous; when both rami are quite distinct and more or less apart, as in most *Sedentaria,* it is termed distichous. (Fig. 3) For instance, in a biramous parapodium of *Nereis* there are; (1) two setigerous lobes (or chaetigerous sacks) carrying the setae and supported by a stout, enclosed, bodkin-like bristle or *aciculum;* (2) parapodial lobes, lips or fillets; (3) a dorsal and a ventral *cirrus.* Branchiae, or gills, simple or branched may be inserted upon the dorsal ramus or between the two rami.

The parapodia are *biramous* when both rami are nearly equally developed; *subbiramous* with a dorsal cir-

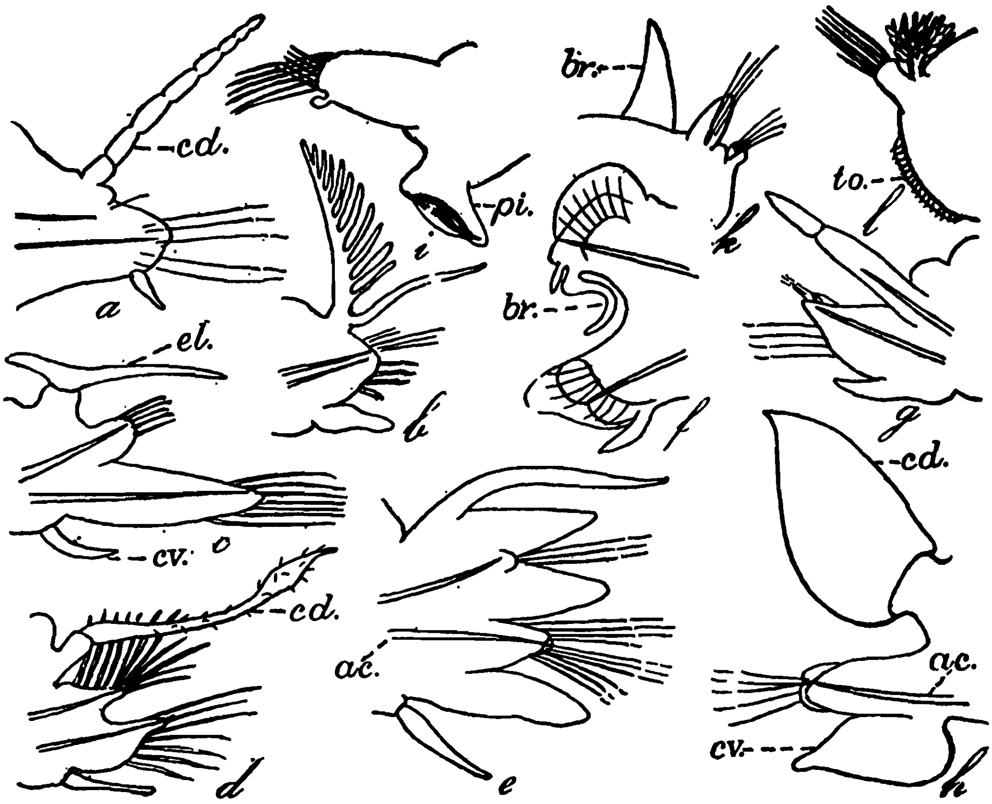


Fig. 3.—Parapodia: *a,* subbiramous, of *Podarke pallida* Claparède; *b,* of *Eunice; c—d,* biramous, elytrogerous and cirrigerous of an Aphroditid; *e,* biramous of *Nereis; f,* biramous of *Nephthys; g,* sesquiramous of *Staurocephalus; h,* uniramous of *Phyllodoce; i,* distichous of *Amphicteis,* dorsal ramus and ventral pinnule; *k,* of an *Aricia; l,* distichous of *Arenicola* (*a.c.* aciculum; *br,* gills; *cd.* dorsal cirrus; *cv,* ventral cirrus *el,* elytron; p*i,* pinnule; *to,* uncinigerous torus).

rus but the dorsal setae-sack and setae more or less reduced; *sesquiramous* when the dorsal lobe is reduced to a few bristles or acicula; *uniramous* when the dorsal ramus is practically wanting, being reduced to the dorsal cirrus.

In the *Sedentaria* the *neuropodia,* or ventral rami, are often reduced to mere transverse ridges, or *uncinigerous tori,* destitute of a cirrus and carrying short hooks or *uncini.*

Setae (or *chaetae*) are chitinous bristles which are very important for the classification and are of very varied shapes and disposition. They may be divided into two groups: (1) the setae s. str., or bristles, and (2) the *uncini,* avicular or acicular hooks.

The setae are simple, jointed, or compound. They may be long, slender, filiform, hair-shaped, *capillary*, smooth or spinulose, curved, flat, limbate, or winged on one or both sides, with frills or transverse rows of spines, geniculate, trumpet-shaped, exceptionally forked at the tip, etc. (Fig. 4) When they are short, stout, bodkin-

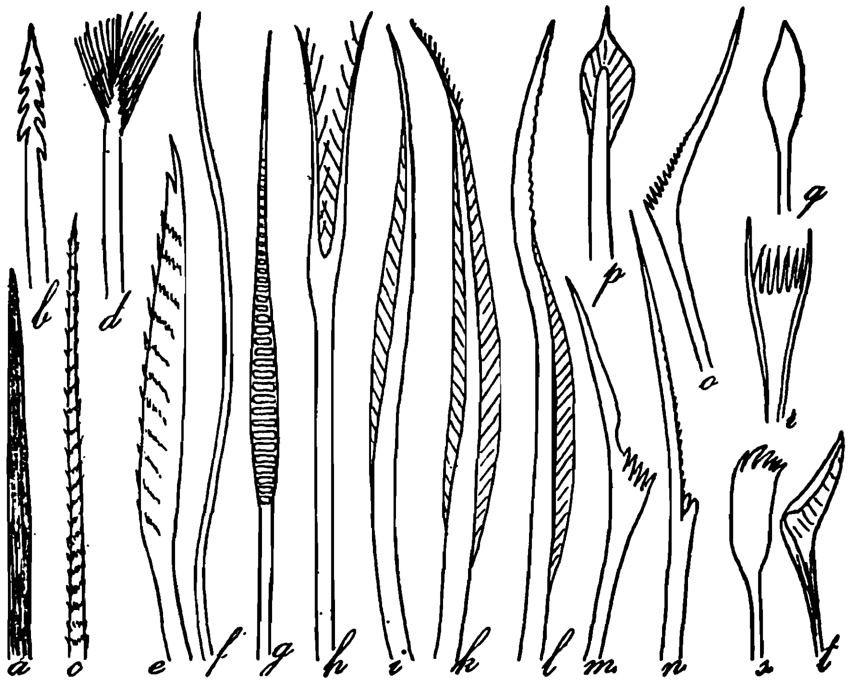


Fig. 4.—Simple bristles ×33—66: *a*, aciculum; *b*, barbed bristle; *c*, spinous capillary; *d*, brush-like; *e*, of *Lagisca* Malmgren; *f*, smooth capillary; *g*, camerated; *h*, lyriform; *i*, limbate or winged; *k*, bilimbate; *l*, *Apomatus* seta; *m*, *Salmacina* seta; *n*, bayonet, of Serpulid; *o*, kneed, or geniculate; *p*, palea; *q*, styliform; *r*, pectinate, or comb-seta; *s*, *t*, paleae of *Sabellaria*.

shaped, or flattened, paddle- or oar-shaped, they are called *paleae*. The articulated, or many-jointed setae of the Chloraemidae and *SIGALIONINAE* are a connecting link with the compound setae with a basal part, or stalk, and a terminal piece elongate, needle-like, or short, sickle-shaped. When both sides of the articulation are the same length it is termed *homogomph*, and *heterogomph* when they are unequal.

The ventral *uncini* of the Maldanidae and Capitellidae are sigmoid hooks with a *rostrum*, a guard, and a *manubrium*. The *uncini* of the *Sedentaria* are often short denticulate plates, such as the *avicular* hooks of the Sabellidae and Terebellidae, with a broad basal manubrium and a beak-like hook, crested with denticles

on the vertex. They are set on the tori in one or two parallel rows. (Fig. 5).

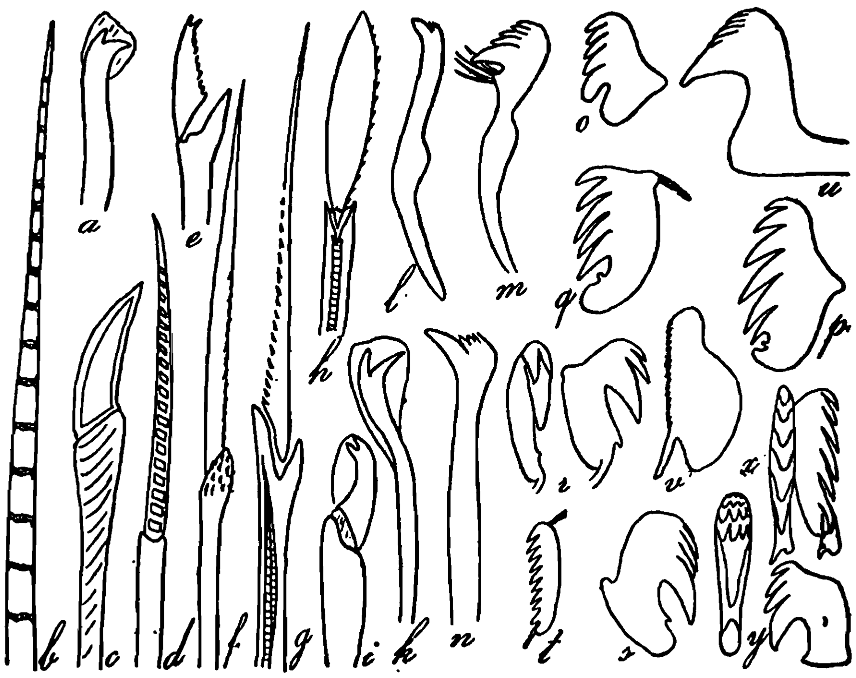


Fig. 5.—Bristles: *a*, acicular seta; *b*, articulate; *c*, compound; *d*, camerated; *e*, sickle shaped (falciger); *f*, *g*, aristate; *h*, paddle-shaped; *i*, bidentate falciger. Hooks and uncini ×100–133; *k*, of *Polydora; l*, *Arenicola; m*, Maldanid; *n*, of *Trichobranchus; o*, *Serpula; p*, *Amphicteis; q*, *Ampharete; r*, *Polymnia*, front and side view; *s*, *Amphitrite; t*, *Chaetopterus; u*, acicular hook of *Sabella; v*, of *Protula; x*, of *Mercierella*, *y*, of *Clione.*

Proboscis. Many *Errantia* are provided with an eversible proboscis armed with strong horny jaws, or beset with papillae, or with chitinous denticles, or *paragnaths.*

The *intestine* is generally straight, rarely coiled, sometimes with glands or diverticula.

Body cavity. In the *Errantia* the body-cavity, or coelom, is generally divided by numerous intersegmental septa, or diaphragms. In the *Sedentaria* these septa are few and generally restricted to the anterior part of the thorax.

Muscles. The muscles are smooth, set in circular layers and stout longitudinal fascicles. Oblique muscles run from the sides to the middle of the ventral side.

Nephridia, or excretory organs, are disposed in pairs on succeeding segments with lateral pores opening on the sides near the feet. In the *Sedentaria,* they are generally reduced to a few thoracic pairs. The anterior ones,

in front of the diaphragm, are purely excretory organs, whilst the others are also used as genital ducts.

The *vascular system* is generally closed and well developed, sometimes very complicated and offering many variations. The dorsal vessel is contractile, but special organs of propulsion, or hearts, may also exist.

The *blood* is red, or emerald green in SABELLIDAE, SERPULIDAE, CHLORAEMIDAE, but is often uncoloured. The respiratory pigments, haemoglobin or chlorocruorin, are in solution in the plasma, only very exceptionally in corpuscles.

Respiration is effected by means of branchiae or gills, of which there are two kinds: (1) genuine branchiae, with vascular loops, and (2) lymphatic gills destitute of vessels and filled with coelomic fluid. The gills exhibit very numerous and varied types. They may consist of simple filaments, straight or coiled, forked or pectinate, set on the dorsal rami of many feet, or branched or bushy and restricted to the anterior segments, disposed as a terminal funnel of many filaments on the head of Sabellids and Serpulids, etc.

Sense organs. The sense organs are the eyes, the nuchal organs, the lateral organs and the statocysts or otocysts. The eyes are not always restricted to the prostomium. The branchial filaments of the Sabellids often bear dorsal or subterminal eyes. The OPHELIIDAE have lateral eye-spots disposed on a number of segments and the pygidium of little Sabellids may carry several eye-spots. We have already mentioned the large eyes of the ALCIOPIDAE. The lateral organs are small ciliated cups, or knobs, present on a number of segments in the CAPITELLIDAE, OPHELIIDAE, ARICIIDAE, etc.

Otocysts, or statocysts, exist only in very few species (ARENICOLIDAE, ARICIIDAE, TEREBELLIDAE and SABELLIDAE)

Colour. Many species are adorned with bright colours and variegated patterns. Unhappily, these colours do not keep well in the preservatives, formol or alcohol. They are due to the red, or emerald green, blood and to solid or dissolved pigments of the epidermis, such as Haemoglobin, Chlorocruorin, Haemerythrin, Tetronerythrin, Melanin, Uranidin and various Lipochromes. These pigments, with the exception of Melanin and a few others, are either dissolved or altered by the preservative fluids.

On the other hand, the splendid iridescence of the bristles of *Aphrodita* and CHLORAEMIDAE, as well as of the body-wall of Eunicids and others, displaying all the changing hues of the rain-bow, are permanent for they are caused by diffraction of the light either by the numerous very fine striae of the setae or the very thin lamellae of the cuticle and these structures are not affected by the spirit.

Phosphorescence is not restricted to the Syllids and other small pelagic species which abound in the plankton; it is also a property of many Annelids creeping on the rocks and algae, and even of tubicolous species. For instance, the luminescence of *Chaetopterus,* living on the bottom inside a thick parchment-like tube, is the most beautiful of all.

REPRODUCTION

The sexes of the Polychaeta are usually separate and even sexual dimorphism may occasionally occur. Nevertheless, a few species are hermaphrodite, especially amongst SABELLIDAE and SERPULIDAE. The ova and spermatozoa are discharged into the sea. The fertilised eggs give rise to a floating Trochophore larva, and then to post-larval stages dropping to the bottom or swimming for a long period.

Asexual reproduction, Blastogamic or Schizogamic, is frequent amongst Syllids and a few other Polychaeta.

Epitoky. A number of Polychaeta, especially amongst SYLLIDAE, NEREIDAE and in a few EUNICIDAE, undergo a peculiar metamorphosis at the epoch of reproduction, acquiring new long swimming bristles, and developing large foliaceous lobes on the feet, whilst the eyes grow larger. For instance, in *Nereis,* the eyes become larger, a few of the anterior dorsal cirri grow thicker at the end, but the anterior segments are not otherwise materially altered; the middle and posterior segments, however, become flattened and crowded together, the enlarged feet develop broad foliaceous lamellae, and shed their bristles which are replaced by new oar-shaped swimming setae. When maturity is perfect and the metamorphosis complete, these *Heteronereis* stages rise in swarms to the surface of the sea, shed their sperm and ova, and then die. In the case of the " Palolo " (*Eunice viridis*), an Eunicid of the Pacific, the posterior part of the worm, a little modified and filled with genital products, breaks off from the ante-

rior part, which remains in the coral reefs, and rises in swarms to the surface where it is taken up for food by the natives. Singularly enough the rise of the "Palolo" is connected with lunar phases. It is very probably the only instance of an edible Polychaete.

Autotomy and Regeneration.

Autotomy is wide-spread amongst Polychaeta. The *POLYNOINAE* easily shed their elytra, the SPIONIDAE their palps, the AMPHARETIDAE and TEREBELLIDAE their gills or their tentacular cirri. Many EUNICIDAE, CAPITELLIDAE and others are so brittle that it is but too often difficult to obtain a whole specimen.

This propensity to autotomy is counterbalanced by a great facility of regeneration and may be turned into a mode of asexual multiplication as in *Phyllochaetopterus* and *Dodecaceria.* It is not uncommon to find a more or less long fragment of the mid-body of an Eunicid having regenerated both a head and a tail. In *Procerastea* and *Dodecaceria* a fragment composed of two segments, or even a single segment, may thus regenerate a whole worm.

HABITS

As already stated the Polychaeta are marine animals; nevertheless a few species can live in brackish water and even, though infrequently, in fresh water. In the brackish water of the Chilka Lake, the Salt Lakes near Calcutta, the Gangetic Delta, and the Taleh Sap, for instance, a few genuine marine species occur with several others more closely adapted to water of low salinity, such as two small *Nephthys, Dendronereides heteropoda,* two CAPITELLIDAE, and two small SERPULIDAE, *Ficopomatus macrodon* and *Mercierella enigmatica.* But species living in fresh water, or water of so low a salinity as to be drinkable, are of much rarer occurrence. Such are however several *Lycastis* and a few other NEREIDAE, several SABELLIDAE of the Baikal Lake, *Mercierella enigmatica* of world-wide distribution in estuaries and rivers, and another little Serpulid, *Marifugia cavatica,* found living in the deep caves of the Karst Region.

The Polychaetes are plentiful on the shore between tide-marks, on coral reefs, and in the shallow littoral waters as far as 200 fathoms, but beyond this, as the depth increases, the number of species rapidly decreases and they

become very scarce in the deep-sea dredgings. But, singularly enough, in the deep-sea fauna many shallow-water species are found associated with rare genuine abyssal forms. For instance, *Amphicteis gunneri,* often collected between tide-marks, has been dredged by the Prince of Monaco in 1885 metres, and in 2750 fms by the " Challenger ", and the common shore Serpulids, *Hydroides norvegica* and *Pomatoceros triqueter,* at 4808 m.

Polychaeta are hence very little affected by depth and pressure.

Genuine pelagic species, usually transparent, and numerous larval and post-larval forms are part of the plankton.

For the most part, the others live on the bottom, boring in the sand or mud, fixed on stones or shells, creeping amongst algae, or burrowing in the crevices of rocks and corals, or amongst stones and shells incrusted with calcareous algae, Sponges, Ascidians and Polyzoa. Some are commensal or ectoparasitic on Hydroids and Echinoderms.

Several of the so-called *Errantia* live nevertheless inside tubes, whilst true *Sedentaria* are sometimes tubeless or vagabond. The limivorous species swallow mud or muddy sand, like the earthworms. The Sabellids and Serpulids, which cannot leave their tubes, feed by means of their branchial tufts, the radii or barbules of which collect the plankton and the small particles of food floating in the water and their cilia carry them to the mouth. Certain *Errantia,* the proboscis of which is armed with stout horny jaws, such as the APHRODITIDAE, NEREIDAE and EUNICIDAE are prowling and hunt living prey.

GEOGRAPHICAL DISTRIBUTION

Most of the species of Polychaeta have a very wide distribution and many are quite cosmopolitan, so that they cannot be grouped into Zoological Provinces. For instance, amongst the 450 species, here recorded from the Indian area, 108, nearly a fourth, are common on the western shores of Europe.

A comparison of the genuine pelagic Annelids of the plankton of Indo-China shows a nearly complete identity with those of the Atlantic.

Many of the Arctic circumpolar Annelids, with the exception of a few peculiar species, are also found in the

temperate Atlantic and Pacific Oceans. In the tropical area, whilst many disappear in the littoral zone, a number of them is still to be found in the deep-sea dredgings, and some of these northern species reappear on the temperate or cold shores of the south-hemisphere.

Antarctic species reach to the south parts of America, Australia and Africa.

Most of the intertropical species are also the same all round the world.

In the Fauna of Japan both arctic and tropical forms are found. This is easily explained. Two streams run along the coasts of Japan: a cold one, the Oja-Siwo, runs down from the glacial Arctic Ocean along the coasts of Kamchatka, Manchuria, Korea and the North-West coast of Japan, bringing with its cold waters the northern species of Polychaeta, whilst the Kuro-Siwo brings to the Eastern coasts the warm waters of the tropical Pacific with part of their fauna.

In short, the distribution of the Polychaeta is mainly regulated by the temperature. In the great depths of the Oceans the temperature is both very low and very uniform all over the world and the Annelidan fauna is also very uniform and contains moreover a number of arctic species which find there the same cold temperature. For the same reason, in the intertropical area the shore and shallow-water species, especially those of the coral reefs, finding the same conditions in the three oceans, are nearly all identical.

The Polychaeta are indeed very sensitive to the temperature and an abrupt rise or fall of a few degrees sometimes kills them outright.

COLLECTING

Pelagic Annelids are easily procured by the towing of a plankton net. Night fishing with artificial light will thus procure a lot of Syllids, epitokous Nereids and many rare small species and larvae. Shore collecting will yield the most varied and abundant crops.

The necessary implements are a stout spade, a crow-bar, a chisel and a canvas bucket, or a fisherman's basket with several glass jars and a number of glass tubes.

Care must be taken to separate large predatory species such as Nereids, Eunicids and Aphroditians. These large and ravenous species, whilst being carried home, are

better kept in damp sand or amongst algae than in water bottles.

Many species burrowing in sand or mud are caught by turning it over with the spade. Each clod must be carefully broken into small parts with the fingers, avoiding any injury to small and delicate species. The sand may also be washed through a sieve in little pools of water.

Many Annelids are to be found creeping on stones or algae or in tubes incrusting them. Loose stones should be carefully turned over and examined, and should then be replaced in their previous position to avoid the decay of the fauna fixed on the upper surface. The crow-bar is used to rip open the crevices of rocks and corals in which a very rich and varied fauna is usually found.

In dredging and trawling, when the dredge or trawl comes on board, and the contents are scattered on deck, it is easy to pick up the large specimens. To search the rubbish for small species, shells and stones coated with Serpulids, Polyzoa, Algae, etc., should be put into broad, shallow, glass vessels, or, better still, into white china wash-hand basins, with sea water. When the water becomes putrid the small boring species and others ensconced in tubes or crevices come out and reach the edges of the vessel where they can easily be picked up.

PRESERVATION

The best preserving medium for Polychaeta is 70—75% alcohol. Formalin is very bad, quite detrimental to good preservation for the specimens rapidly become soft, sticky and nearly useless. Nevertheless, in an emergency, and for large species, it may be used for a short time previous to spirit (5% of the commercial solution of formalin). On the other hand, when specimens have been first hardened in strong spirit they may next be kept in formalin with less inconvenience.

For histological purposes, Bouin, Brasil or Zenker fluids are amongst the best.

Delicate and brittle species must be naroctised previously to fixing in spirit. This is easily done by adding *very gradually*, small quantities of alcohol (up to 5% or 10%) to the sea water. Other anaesthetics such as cocaine, chloral, etc., may also be used for the same purpose. To avoid too great a contraction of large species they may first be put into very weak spirit (30—40%) and be

kept well stretched with pincers; or bamboo or horn spatulae, and as soon as they cease to react they should be immersed in 70–90% alcohol. To ensure a good preservation the volume of alcohol must be greater than the specimen's and it must be renewed after a few days.

Preserved specimens should be kept separate in glass tubes, the smaller ones, in small tubes with a cotton-wool stopper, are packed together in larger vessels filled with 70–75% alcohol. The paper, or parchment, labels must be put *inside* the tubes with inscriptions, in pencil or permanent Indian-Ink, carefully noting the date and locality, the colour of the living animal and other particulars.

IDENTIFICATION

To identify a specimen it is necessary carefully to note the divisions of the body, if any, the form of the prostomium, the eyes, the tentacles, tentacular cirri, gills, and the proboscis with its jaws and denticles, when there is one. Next in importance are the parapodia or feet with their bristles of high specific value. But as the structure of the feet and the form of the setae often vary materially in the anterior, middle and posterior parts of the body it is always necessary to examine a number of them. This is easily done by tearing, or cutting, with sharp pincers, or scissors, a whole series of feet, say nine for a *Nereis*, and disposing them in three rows on a slide, three anterior, three median and three posterior ones, the relative numbers of the segments they belong to being carefully noted on the label.

If a permanent preparation be wanted, rapidly drain the alcohol from the slide and before the parapodia get dried drop on them a small quantity of melted gelatin-glycerin, put on a cover-slip and warm slightly, if necessary; the preparation will then keep for years.

Mounting in Canada balsam is not recommended, the setae—unless previously coloured—becoming too transparent and the fine structures indiscernible.

CLASSIFICATION

Annelida Polychaeta.

Annulated worms with numerous specially differentiated chitinous bristles carried on parapodia, or feet,

lateral processes of the segment's body-wall. Various appendages present, antennae, palps, cirri, gills. Marine animals, very exceptionally living in fresh water. Sexes usually separate.

I. *ERRANTIA.*

Body usually vermiform, very long, segments numerous, nearly all alike, the first near the mouth excepted. Generally with cephalic appendages, antennae, palps, tentacular cirri; feet uniramous or biramous, with both rami hardly different; acicula present; frequently gills above the feet.

II. *SEDENTARIA.*

Body divided into distinct regions. Head small, hardly distinct or greatly modified. Feet generally simple, the ventral rami are often *tori,* or pinnules, with hooks or *uncini;* gills usually limited to a part of the body. Usually tubicolous.

According to Benham, the families may be grouped as follows:

A. PHANEROCEPHALA

(Head distinct)

Sub-Order I. Nereidiformia (*Errantia* auct. and *Ariciidae*)

Antennae and palps. Peristomium with special cirri. Eversible proboscis often with jaws.

Families: SYLLIDAE, HESIONIDAE, APHRODITIDAE, PHYLLODOCIDAE, TOMOPTERIDAE, NEREIDAE, NEPHTHYDIDAE, AMPHINOMIDAE, EUNICIDAE, GLYCERIDAE, SPHAERODORIDAE, TYPHLOSCOLECIDAE and ARICIIDAE.

Sub-Order II. Spioniformia.

Prostomium reduced to a mere knob, neither tentacles nor palps. Eversible proboscis without jaws. The peristomium usually carries a pair of long tentacular cirri and extends forwards at the two sides of the prostomium.

Families: SPIONIDAE, CHAETOPTERIDAE, MAGELONIDAE and AMMOCHARIDAE.

Sub-Order III. Terebelliformia.

Prostomium destitute of appendages. The achaetous peristomium may carry cirri and tentacles. Proboscis not eversible, unarmed.

Families: Cirratulidae, Terebellidae, Amphare-tidae and Amphictenidae.

Sub-Order IV Capitelliformia.

No prostomial processes. Peristomium without appendages. Proboscis unarmed. An accessory gut. No blood vessels. Lateral sense-organs.

Family: Capitellidae.

Sub-Order V Scoleciformia.

Antennae and palps wanting. Peristomium without appendages. Proboscis unarmed. Blood vessels present.

Families: Opheliidae, Maldanidae, Arenicolidae, Scalibregmidae, Chloraemidae and Sternaspididae.

B. CRYPTOCEPHALA

(Head indistinct)

Sub-Order I. Sabelliformia.

Prostomium entirely hidden by the forward extension of the peristomium. Palps greatly developed, branched and acting as respiratory organs. Tube membranous or calcareous.

Families: Sabellidae, Eriographidae, Amphicor-inidae and Serpulidae.

Sub-Order II. Hermelliformia.

Peristomium enormously developed and forming a bilobed hood capable of closing over the mouth

Family: Hermellidae.

Key to the Families.

Errantia

1. Elytra on a certain number of feet, the rest carrying cirri	Aphroditidae, p. 23.
Without elytra	2
2. A fan-shaped group of broad flattened setae (paleae) on all segments ..	Chrysopetalidae, p. 78.
No such groups of setae	3
3. Prostomium not distinct; pedal cirri globular or absent	4
Prostomium distinct	6
4. Feet biramous but without setae; prostomium fused with the following segments, flanked by two long cirri containing aciculi; pedal cirri absent	Tomopteridae, p. 140
Feet uniramous, with globular cirri	5
5. Pharynx armed with four teeth; prostomium fused with buccal segment, which is emarginate in front	Pisionidae, p. 76.
Pharynx unarmed; prostomium indistinct; tegument covered with small papillae and typically bearing in addition a certain number of large spherical capsules in transverse rows	Sphaerodoridae.
6. Prostomium conical, without tentacles or palps; dorsal and ventral cirri foliaceous; setae rare, simple, acicular	Typhloscolecidae, p. 139.
Prostomium with tentacles and usually with palps	7
7. Prostomium small, with five tentacles; caruncle almost always present; mouth situated somewhat far back on ventral surface; gills well developed; pharynx unarmed ..	Amphinomidae, p. 80.
Prostomium well developed ..	8
8. Pharyngeal armature complex	Eunicidae, p. 228.
Pharyngeal armature simple or absent	9
9. Tentacles not more than three	10
Tentacles more than three ..	12

10. Palps simple, but often united together so as to be hardly recognizable; pharynx armed with one large tooth or a crown of denticles, and followed by a more strongly muscular gizzard; tentacles three; parapodia uniramous except in the sexually mature form of certain species	SYLLIDAE, p. 145.
Palps biarticulate, sometimes absent; pharynx armed or unarmed; gizzard absent	11
11. Dorsal cirri short or of moderate length, not moniliform; pharynx armed with a single pair of strong toothed jaws; tentacles two; parapodia almost always biramous	NEREIDAE, p. 163.
Dorsal cirri long and more or less distinctly moniliform; pharynx cylindrical, armed with at most a small pair of jaws (*Magalia*), usually only with stylets or unarmed; tentacles two or three; parapodia sesquiramous or biramous	HESIONIDAE, p. 103.
12. Palps small; prostomium conical, slender, annulate, terminated by four small tentacles arranged in the form of a cross; pharynx large, covered with papillae, armed with at least four teeth; parapodia biramous (*Hemipodus* excepted)	GLYCERIDAE, p. 281.
Palps absent; prostomium more or less normal	13
13. Parapodia biramous, with normal cirri and a sickle-shaped gill between the rami; tentacles four; pharynx with soft papillae; all setae simple	NEPHTHYDIDAE, p. 223.
Parapodia with foliaceous cirri, without sickle-shaped gill, generally uniramous	14
14. General appearance (including the single pair of eyes) normal; tentacles four or five	PHYLLODOCIDAE, p. 114.
Prostomium flanked by a pair of large globular eyes; tentacles four; tissues transparent; pelagic worms	ALCIOPIDAE, p. 132.

SEDENTARIA

1. Body clearly divided into regions	8
Body not clearly divided into regions	2
2. Segments numerous, without anal gills, without broad ventral shield	3
Body short, swollen; segments few; filiform anal branchiae. A large ventral shield bordered with stiff setae	STERNASPIDIDAE, p. 401.
3. Palps elongated, tentacle-like	4
Without tentacle-like palps	7
4. Two large tentacular palps on the prostomium	5
One or more pairs of palps inserted on the anterior segments. Branchiae simple, filiform, inserted above the feet. Capillary setae and acicular setae. Prostomium conical, without processes	CIRRATULIDAE, p. 329.
5. Two palps and two bundles of subulate branchiae retractile into a buccal funnel. The protracted setae of the first feet forming a cephalic cage. Body thickly covered with papillae	CHLORAEMIDAE, p. 344.
Two long canaliculate palps, not retractile into the mouth. Without cephalic cage	6
6. Palps without suckers. Parapodial lamellae erect, dorsal branchiae cirriform. Hooded hooked setae	SPIONIDAE, p. 311.
Palps with sucker-like papillae. Without branchiae, Prostomium oval, broad and flattened (spoon-shaped)	MAGELONIDAE, p. 329.
Anterior dorsal and ventral cirri flask-shaped or frilled. Thread-like lateral branchiae. Numerous kinds of setae	DISOMIDAE, p. 327.
7. One median tentacle. Dorsal cirri. Dorsal foliaceous branchiae. Capillary setae and hooded setae	PARAONIDAE.
Prostomium with, or without two short tentacles; both parapodial rami more or less conspicuous. Capillary setae and forked setae. No hooks	SCALIBREGMIDAE, p. 354.

Prostomium blunt, without appendages or with a crown of laciniated lobes. Without branchiae. Ventral tori with many rows of very small uncini. Sandy tube	OWENIDAE, p. 390.
Prostomium with a keel, or a rimmed cephalic plate, without process. An anal plate or an anal funnel with cirri. Without branchiae. Dorsal setae capillary. Ventral tori with elongated sigmoid hooks	MALDANIDAE, p. 375.
8. A terminal branchial tuft with numerous filaments bearing secondary processes. Prostomium indistinct. Uncini ventral in the thoracic region, dorsal in the abdominal region. Tube membranaceous or calcareous	17
Without terminal branchial tuft	9
9. Modified setae (paleae) forming an operculum closing the tube	16
Without opercular setae	10
10. Prostomium conical or blunt, without process. Branchiae on many segments	13
Prostomium more or less distinct. One pair of tentacle-like palps or numerous tentacular filaments	11
11. Prostomium with or without two small tentacles. Two long canaliculated palps. 2-3 strikingly dissimilar regions, the anterior short, with uniramous feet bearing peculiar setae in the fourth setigerous segment. Posterior notopodia erect. Uncini comb-like	CHAETOPTERIDAE, p. 336.
Without tentacles. A cephalic veil and numerous tentacular filaments. Ventral tori with pectinate uncini	12
12. Tentacular cirri retractile into the mouth. Prostomium distinct. 3-4 pairs of subulate branchiae inserted on the first segments	AMPHARETIDAE, p. 406.
Tentacular cirri not retractile into the mouth. Prostomium indistinct. Branchiae arborescent, or rarely subulate, one,	

two or three pairs in number, inserted on the first segments; they are sometimes wanting .. TEREBELLIDAE, p. 415.

13. With uncinigerous tori .. 15

Without uncinigerous tori .. 14

14. Serrated capillary setae and acicular hooks. Feet and branchiae conspicuous and erected on the back of the abdominal region .. ARICIIDAE, p. 300.

Only capillary setae. Feet without lobes. Branchiae lateral and ligulate. Prostomium sharp, conical .. OPHELIIDAE, p. 357.

15. Prostomium blunt. Anterior region abranchiate; middle region with dorsal arborescent branchiae not retractile; often an achaetous and abranchiate caudal region .. ARENICOLIDAE, p. 375.

Prostomium conical. Anterior region abranchiate; posterior region with branchiae simple, rudimentary or wanting; or sometimes multifid and then retractile into lateral pouches. In the abdominal region dorsal and ventral tori with sigmoid hooded hooks .. CAPITELLIDAE, p. 362.

16. An operculum of one anterior row of large golden setae (paleae). Posterior region (scapha) very small, leaf-like and with hooks at the base. Two pairs of anterior foliated branchiae. A free tube of sand-grains, slightly conical, open at both ends .. AMPHICTENIDAE, p. 402.

Two large opercular stalks bearing a crown of paleae. Branchiae dorsal and numerous. A narrow smooth achaetous and abranchiate caudal region. Fixed tubes of sand grains often clustered in big reef-like masses .. .. SABELLARIDAE, p. 393.

17. Without operculum. No thoracic membrane. Tube membranaceous or mucous .. SABELLIDAE, p. 437.

Usually with an operculum. A thoracic membrane. Tube calcareous .. .. SERPULIDAE, p. 452.

POLYCHAETA ERRANTIA

Family APHRODITIDAE Savigny.

Body short, ovate, or long and vermiform. Prostomium rounded or bilobed. One, or three, tentacles, 2 palps, 2 pairs of tentacular cirri with setae. Proboscis cylindrical bordered with soft papillae and with 4 chitinous jaws. (*HERMIONINAE* excepted) Dorsally rounded, flattened pairs of elytra alternating, more or less regularly, with dorsal cirri. Feet biramous. Dorsal setae simple, ventral setae simple or compound.

Remarks. The chief character of the family is the presence of elytra which are flattened discoidal organs borne on the dorsal surface of the feet, usually imbricated, often fringed and covered with papillae.

Key to Subfamilies.

1. Elytrigerous and cirrigerous segments alternating more or less regularly	2
In the anterior part of the body, elytrigerous segments alternating; in the posterior part all the segments bear elytra. Compound setae. Body long and cylindrical	Subfamily *SIGALIONINAE*, p. 60.
2. In the anterior part of the body, a cirrigerous segment between two elytrigerous; in the posterior part, all the cirrigerous segments are inserted between two elytrigerous. Without compound setae ..	3
Only one cirrigerous segment between two elytrigerous. Body vermiform. Without compound setae	Subfamily *ACOETINAE*, p. 70.
3. Eyes pedunculate (rarely sessile). A single tentacle. Facial tubercle very conspicuous	Subfamily *HERMIONINAE*, p. 28.
Eyes sessile. 3 tentacles. Facial tubercle wanting or obsolete ..	Subfamily *POLYNOINAE*, p. 31.

Subfamily *HERMIONINAE* Grube.

Body oval, depressed, a pair of eyes, a median tentacle under which is a papillose facial tubercle. No lateral tentacles. Proboscis devoid of horny teeth. Elytra 15 pairs.

Key to the genera.

1. Harpoon-shaped dorsal spines present	2
Without harpoon-shaped dorsal spines	3
2. Ventral bristles with spurs	*Hermione* Blainville, p. 28.
Ventral bristles with a fringe of hairs .. .	*Lastonatonice* Kinberg, p. 29.
3. Dorsal bristles smooth	4
Dorsal bristles flattened, serrated	*Pontogenia* Claparède, p. 29.
4. Dorsal bristles acicular. A thick dorsal felt	*Aphrodita* Linn., p. 24.
Dorsal bristles sabre-like; no dorsal felt present	*Aphrogenia* Kinberg, p. 27.

Genus APHRODITA Linnaeus.

Eyes sessile. Elytra hidden under a thick, close felt. Ventral bristles acicular, disposed in 3 tiers. Dorsal setae of two kinds, (1) stout, smooth, piercing the felt, (2) very long and slender, iridescent.

Key to the species of Aphrodita.

1. Dorsal bristles long, golden, curving backwards, thatch-like	*australis* Baird, p. 26.
Dorsal bristles, short, erect, dark coloured .	2
2. Dorsal bristles with a slender end. Ventral bristles very hairy	*talpa* Quatrefages, p. 26.
Dorsal bristles straight, blunt. Ventral bristles smooth in the adult	*aculeata* Linn., p. 24.

1. Aphrodita aculeata Linnaeus (Fig. 6, *a—g*).

Aphrodita aculeata, McIntosh, 1900, p. 247: Fauvel, 1923, p. 33, fig. 10. *Aphrodita japonica*, Marenzeller, 1879, p. 3, pl. I, fig. 2: Izuka, 1912, p. 74, pl. IX, fig. 1—3.

Dorsal setae short, erect, blackish, protruding very little over the dorsal felt. Slender lateral setae beautifully iridescent. Ventral setae smooth, without lateral hook.

Length: 100—200 mm.

Occurrence: Santapalli, Madras Presidency.

Distribution: Japan, Indian Ocean, Mediterranean Sea, Atlantic Ocean, North Sea and English Channel.

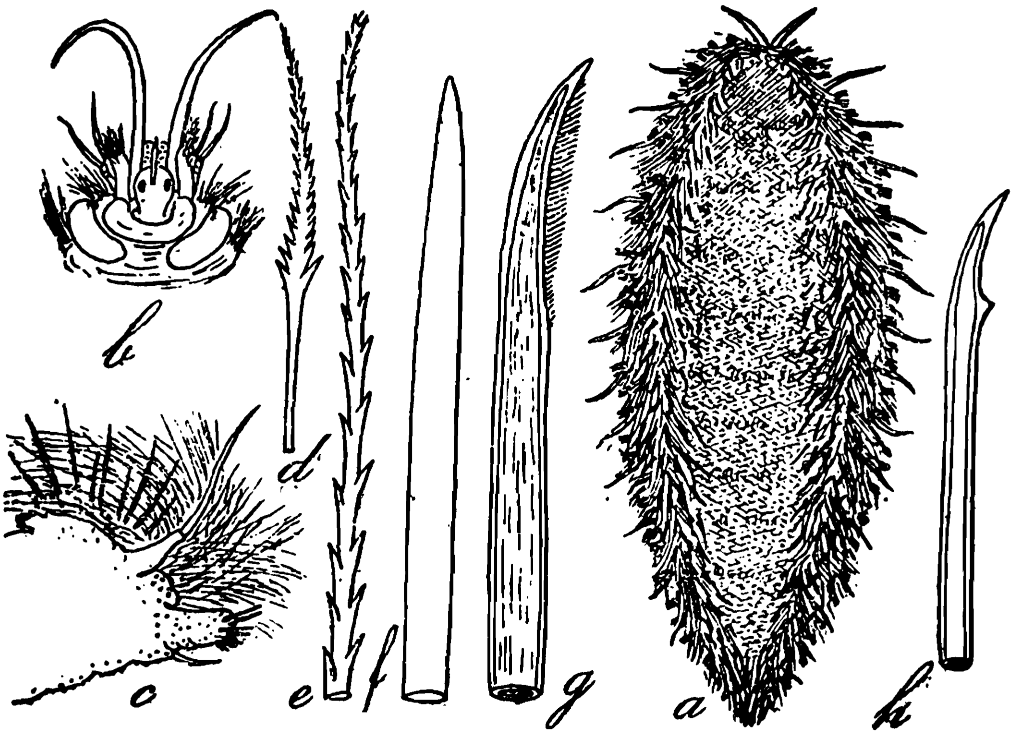


Fig. 6.—*Aphrodita aculeata* Linn. *a*, natural size; *b*, head; *c*, cirrigerous foot; *d*, bipinnate seta from an anterior foot; *e*, spinous bristle from one of the last segments; *f*, stout dorsal bristle ×35; *g*, hairy ventral seta of the young ×40.

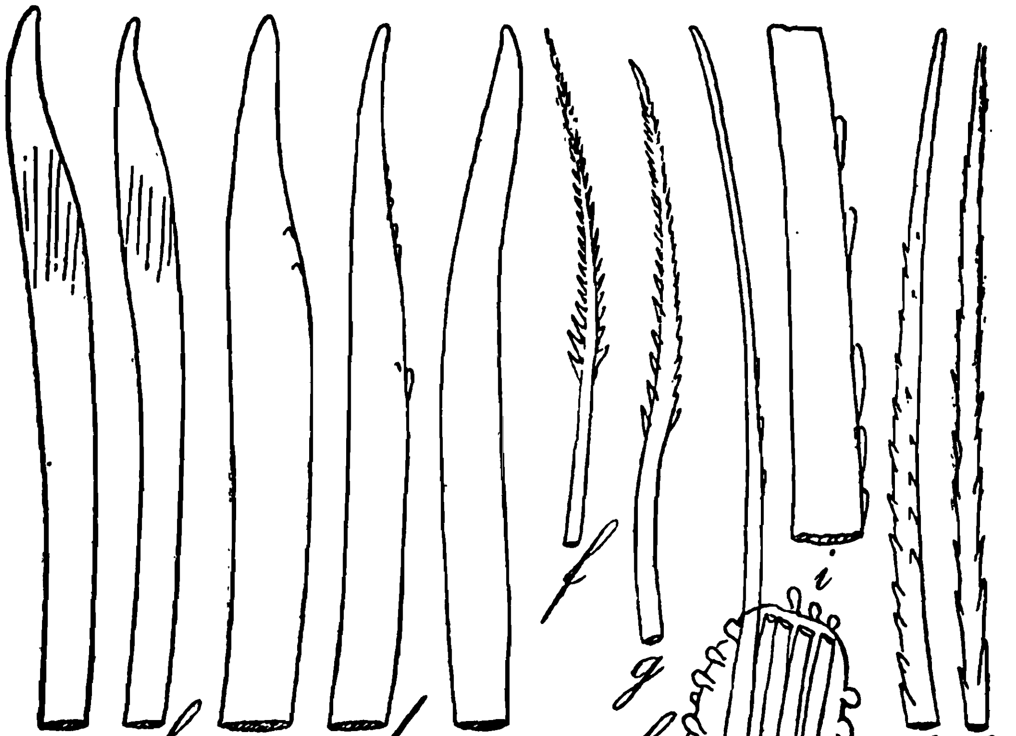


Fig. 7.—*Aphrodita australis* Baird: *a*, *b*, ventral bristle ×47; *c*, *d*, inferior ventral bristles from two hind feet ×109; *e*, ventral from mid-body ×47; *f*, *g* bipinnate setae from the 2nd foot ×109; *h*, ventral ramus of a posterior foot ×8 *i*, middle part of the same ×270; *k*, inferior ventral seta of a hind foot ×109; *l*, capillary bristle of the last feet ×230.

2. **Aphrodita australis** Baird (Fig. 7, *a—l*).

Aphrodita australis, McIntosh, 1885, p. 34, pl. VII, fig. 6—7: Fauvel, 1917, p. 165, fig. 1; 1923a, p. 136, fig. 3 (Synonymy).
Aphrodita terrae-reginae, Haswell, 1883, p. 271.
Aphrodita haswelli, Johnston, 1908, p. 241, pl. LIX, fig. 1—8:
Aphroditella malayana, Horst, 1917, p. 48, pl. XI, fig. 1—3.

Large dorsal setae, golden, long, curving backwards over the back, with a slender end. Ventral setae smooth. Dorsal felt rough and thick. Lateral slender setae faintly irridescent.

Length: up to 100 mm. by 50 mm.

Occurrence: Laccadive Sea, 637 fms; West of Comorin, 670 fms.

Distribution: Japan, Australia, Indian Ocean.

3. **Aphrodita talpa** Quatrefages (Fig. 8, *a—l*).

Aphrodita talpa, Quatrefages, 1865, I, p. 196, pl. III, fig. 24 (non Ehlers, nec Benham, Fauvel 1917, Augener): Fauvel, 1925, p. 140, fig. 4.
?*Aphrodita castanea*, Moore, 1910, p. 380, pl. XXIII, fig. 85—97.
?*Aphrodita longipalpa*, Essenberg, 1917, p. 403, pl. XXI, fig. 1—14.

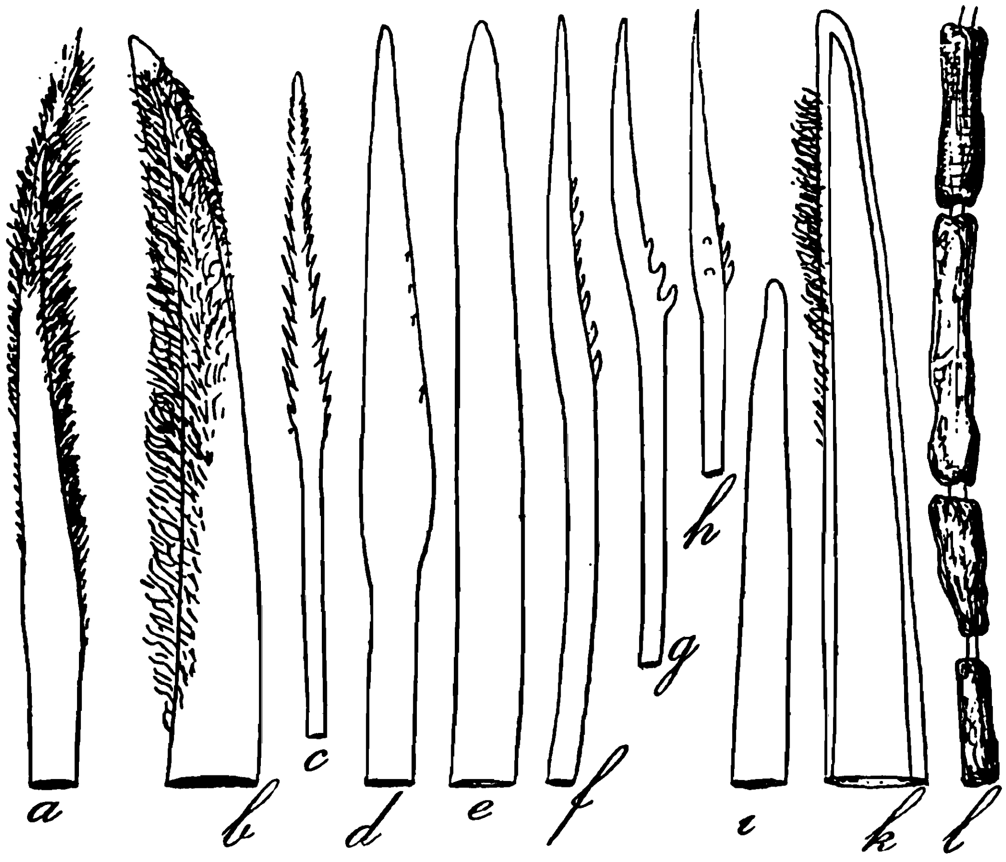


Fig. 8.—*Aphrodita talpa* Quatrefages: *a, b,* ventral hairy bristles from mid-body ×109; *c, d,* bipinnate and hastate bristles from 2nd foot ×109; *e, f, g,* superior and inferior ventral bristles of a posterior foot ×109; *h, i, k,* upper median and lower bristles from a hind foot ×109; *l,* dorsal capillary coated with mud ×47.

Dorsal bristles with a slender end. Lateral capillary setae lustreless, or very faintly iridescent, more or less densely coated with cylinders of mud. Ventral setae hairy, without any hook or spur.

Length: 15—30 mm. by 13—25 mm.

Occurrence: Andaman Islands, Bay of Bengal, Orissa Coast, Malabar Coast, Laccadive Sea, Gulf of Oman.

Distribution: Pacific Ocean, China, New Zealand, South Australia, Indian Ocean.

Genus APHROGENIA Kinberg.

Sabre-like dorsal bristles. Ventral setae bifurcated. Without dorsal felt.

4. Aphrogenia alba Kinberg (Fig. 9, *a—h*)

Aphrogenia alba, Kinberg, 1857, p. 6, pl. II, fig. 6: Fauvel, 1932, p. 9.

Aphrogenia villosa, Horst, 1917, p. 63, pl. XIV, fig. 10—12: Augener, 1926, p. 439.

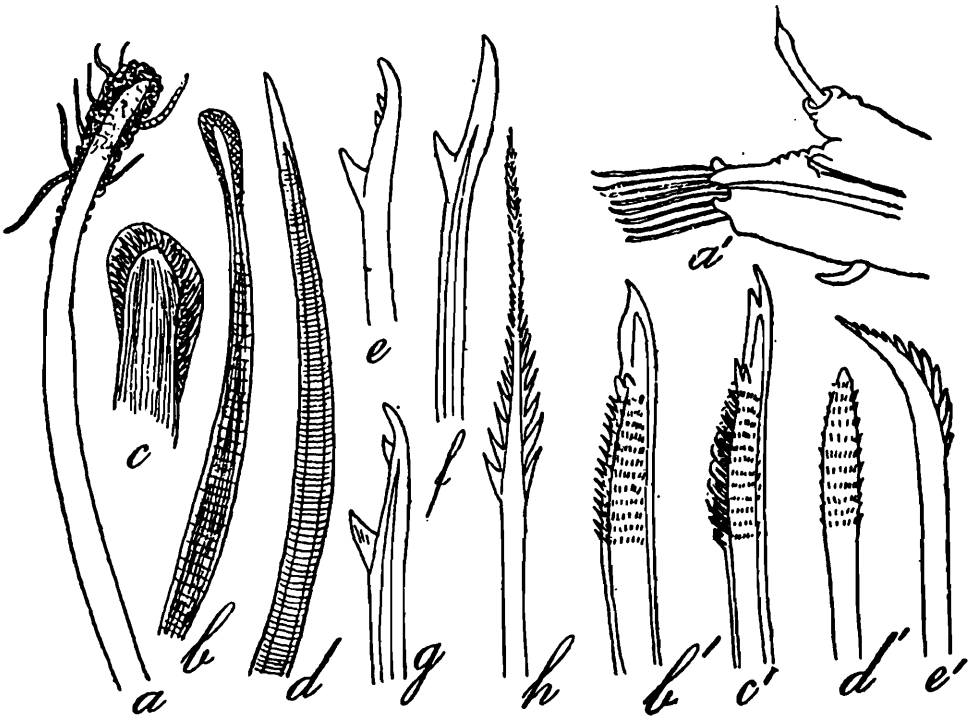


Fig. 9.—*Aphrogenia alba* Kinberg: *a*, big dorsal bristle coated with parasitic Algae ×47; *b*, dorsal knobbed seta ×47; *c*, end of same ×117; *d*, sabre-like dorsal bristle ×47; *e*, *f*, *g*, three ventral furcate setae; *h*, bipinnate seta from the first setigerous segment ×230. *Lepidonotus melanogrammus* Haswell *a'*, foot ×8; *b'*, posterior ventral seta ×62; *c'*, anterior bidentate seta ×62; *d'*, *e'*, bristle front and side view, ×117.

Elytra 13 pairs, uniformly white, with a faint mother-of pearl gloss and with scattered minute papillae. Dorsal cirri long, with a clavate tip. Dorsal bristles stout and curved. Ventral setae with two unequal limbs, sometimes villose with a parasitic growth. Elytra uniformly white or pearly, sometimes with a faint pattern.

Occurrence: Port Blair, Andamans; Ceylon.

Distribution: Malay Archipelago, Indian Ocean, West Indies.

Genus HERMIONE Blainville.

Harpoon-shaped dorsal bristles. Ventral setae bifurcated and toothed, but not fringed. Dorsal felt absent.

5. Hermione hystrix (Savigny) (Fig. 10).

Hermione hystrix, Fauvel, 1923, p. 35, fig. 11 (Synonymy); 1932, p. 10.

Hermione malleata, Grube, 1878, p. 17: Willey, 1905, p. 245, pl. I, fig. 3—4; Potts, 1909, p. 329; Horst, 1917, p. 52, pl. XII, fig. 11—13.

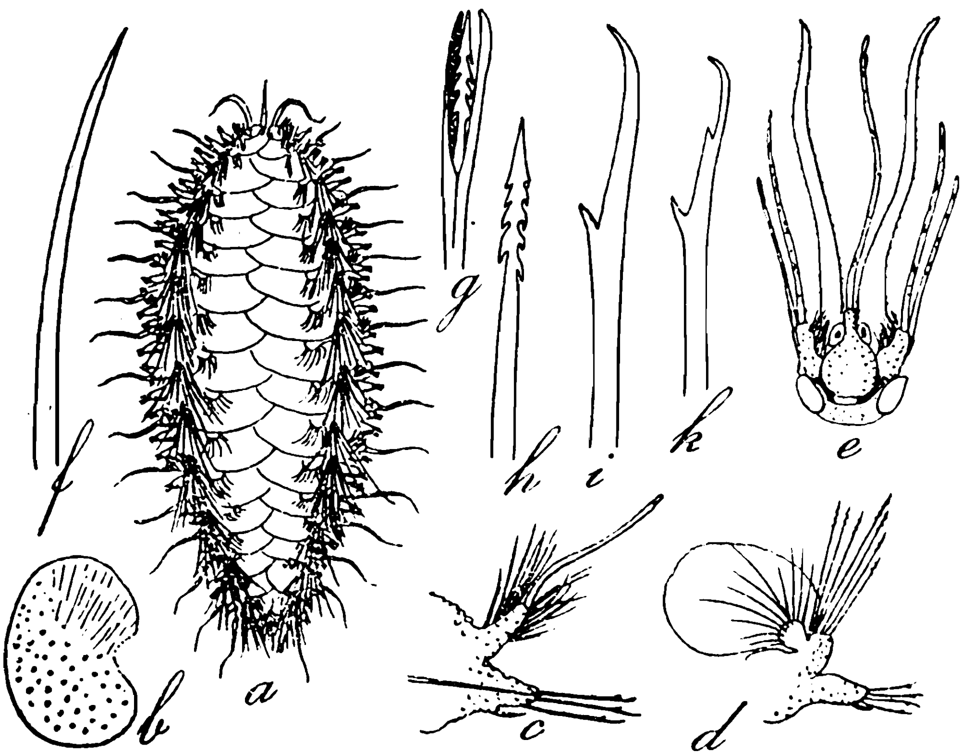


Fig. 10.—*Hermione hystrix* (Savigny): *a*, dorsal view, natural size; *b*, elytron ×4; *c*, *d*, elytrigerous and cirrigerous feet; *e*, head; *f*, dorsal sabre-like bristle; *g*, *h*, harpoon-shaped bristles; *i*, *k*, ventral bristles.

Body oval, flattened. Median tentacle very variable in length. Elytra smooth. Dorsal bristles erect, diverging, spear-like, with lateral recurved fangs at the tip which is often enclosed in a sheath. Ventral setae bifurcated

with a short limb and a longer one curved, smooth (or toothed in the anterior and posterior feet).

Length: 50—60 mm.

Colour: pale brown.

Occurrence: Nankauri, Nicobar Islands; Ceylon.

Distribution: Philippine Islands, Malay Archipelago, Indian Ocean, Red Sea, Mediterranean, Atlantic.

Genus LAETMATONICE Kinberg.

Harpoon-shaped dorsal bristles. Ventral setae bifurcated, with a fringe of hairs at the distal end. A dorsal felt, sometimes very little developed.

6. Laetmatonice producta Grube, var. benthaliana McIntosh. (Fig. 11, *f—g*).

Laetmatonice producta, McIntosh, 1885, p. 45, pl. VIII, fig. 4—5, pl. IV, fig. 12: Moore, 1903, p. 420: Izuka, 1912, p. 89, pl. IX, fig. 7—10; Fauvel, 1932, p. 10.

Elytra 15—18 pairs, delicate, finely granular with radiating lines. No dorsal felt (?). Dorsal spines very large, with 3-4 fangs on each side. Slender bristles from the inner dorsal tuft overlapping the elytra. Ventral setae with a spur and a long fringe of hairs. Ventral cirri small, filiform, inserted about the middle of the foot, which is long and slender.

Occurrence: Ceylon.

Distribution: Japan, Indian Ocean.

Genus PONTOGENIA Claparède.

Dorsal bristles (paleae) golden yellow, slightly bent, arranged like a fan. Ventral setae few, bifid. A dorsal felt usually present.

Key to the species of Pontogenia.

1. No dorsal felt	.. ..	*nuda* Horst, p. 30.
A dorsal felt	.. ..	*indica* Grube, p. 29.

7. Pontogenia indica Grube.

Pontogenia indica, Grube, 1878, p. 19, pl. I, fig. 4; Willey, 1905, p. 246, pl. I, fig. 5.

Elytra 18 pairs. 43—45 segments. Back covered by the bent dorsal setae (paleae). A dorsal felt. Palps beset with longitudinal rows of delicate recurved papillae. A granulated facial tubercle. Two pairs of eyes on ommatophores. Paleae rather narrow, denticulated on each side. Ventral setae short, stout, bidentate.

Length: 20 mm.–26 mm.

Occurrence: Ceylon; Singapore.

Distribution: Philippine Islands, Indian Ocean.

8. **Pontogenia nuda** Horst. (Fig. 11, *a* and *b*).

Pontogenia nuda, Horst, 1917, p. 62, pl. XIV, fig. 5–7.

Fig. 11.—*Pontogenia nuda* Horst: *a*, ventral bristle ×80; *b*, dorsal bristle ×30. *Lepidonotus dictyolepis* Haswell: *c*, upper ventral seta ×240; *d*, lower ventral seta ×240; *e*, dorsal bristle ×290 (after Augener). *Laetmatonice producta* Grube: *f*, dorsal harpoon seta, *g*, ventral bristle, enlarged.

No dorsal felt. Long skin papillae. 15 pairs of elytra. Paleae rather broad, faintly curved, showing two rows of cusps, lying at some distance from one another and cup-shaped. A dorsal fascicle of capillary setae. Teeth of the bifurcated apex of the ventral setae obtuse and short.

Occurrence: Andaman Islands; Off Cape Negrais, Burma, 40 fms.

Remarks: *P. nuda* differs from the European *P. chrysocoma* in the absence of a dorsal felt and with its paleae more boldly serrated. They may be only varieties.

Subfamily *POLYNOINAE* Grube. (Fig. 12).

Body short, or rarely elongate. Elytra 12—18 pairs, inserted on segments, 2, 4, 5, 7, 9,. .23, 26; 29, etc.

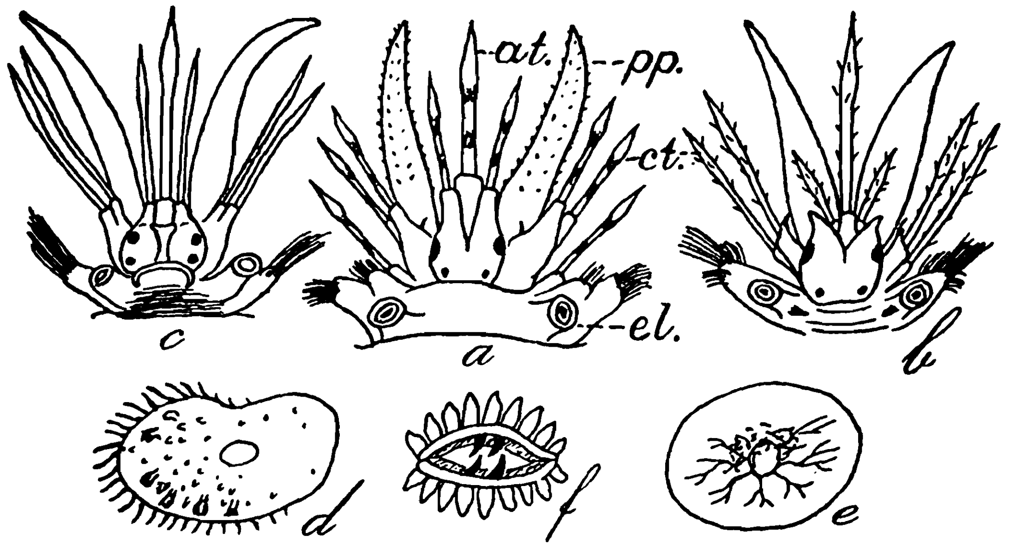


Fig. 12.—*POLYNOINAE*. Prostomium: *a*, type *Lepidonotus*; *b*, type *Harmothoë*; *c*, type *Halosydna*; *d*, fringed and tuberculate elytron; *e*, smooth elytron; *f*, front view of the proboscis with papillae and four jaws.
For explanation of *at*, *ct*, *el*, and *pp*. see fig. 2, p. 5.

Prostomium bilobed, with 4 sessile eyes, 3 tentacles, 2 long palps. Proboscis with a row of terminal papillae and 4 horny jaws. Feet biramous. Setae all simple. 2 anal cirri.

Key to the genera.

1. Only two tentacles. 13 pairs of elytra ..	*Iphione* Kinberg, p. 32.
Three tentacles ..	2
2. Lateral tentacles inserted terminally	3
Lateral tentacles inserted ventrally	8
3. Elytra 12 pairs ..	4
Elytra more than 12 pairs ..	5
4. Elytra very small and tough. Ventral setae trifurcate .	*Hermenia* Grube, p. 38.
Elytra normal. Ventral setae unidentate or bidentate	*Lepidonotus* Leach, p. 33.
5. Elytra, 30 pairs or more	*Lepidasthenia* Malmgren, p. 56.
Elytra less than 30 pairs	6
6. Cirrophores very large	*Drieschia* Michaelsen, p. 54.
Cirrophores normal	7

7. Elytra with longitudinal dark stripes. Dorsal setae few or absent	*Hyperhalosydna* Augener. p. 52.
Elytra soft, translucent. Dorsal setae stout	*Allmaniella* McIntosh, p. 53.
8. Fifteen pairs of elytra	9
More than fifteen pairs of elytra	13
9. Elytra covering the whole body	10
Elytra leaving the posterior segments of the body uncovered	*Lagisca* Malmgren, p. 41.
10. Ventral setae bidentate	11
Ventral setae unidentate	12
11. Setae transparent as crystal, with spinous pouches	*Scalisetosus* McIntosh, p. 49.
Setae without spinous pouches	*Harmothoë* Kinberg, p. 42.
12. Dorsal setae capillary	*Gattyana* McIntosh, p. 39.
Dorsal setae stouter than the ventral setae	*Eunoë* Malmgren, p. 39.
13. Eyes absent. Dorsal and ventral setae similar, flattened, vitreous	*Admetella* McIntosh, p. 53.
Eyes conspicuous, dorsal and ventral setae unlike	14
14. Tentacles and cirri long and club-like. Very conspicuous ventral lamellae ..	*Gastrolepidia* Schmarda, p. 51.
Tentacles and cirri tapering. Dorsal tubercles conspicuous	*Hololepidella* Willey, p. 59.

Genus IPHIONE Kinberg

Body short, oval. 13 pairs of elytra. Only two tentacles which are inserted laterally; facial tubercle present. Dorsal setae more slender than the ventral, which are unidentate.

9. Iphione muricata Savigny (Fig. 13, a—e).

Iphione muricata, Seidler, 1922, p. 75 (Synonymy); Willey, 1905, p. 246, pl. I, fig. 6; Gravely, 1927, p. 4, pl. IX, fig. 1; Pruvot, 1930, p. 3, fig. 1.

Iphione spinosa, Michaelsen, 1892, p. 5.

Body oval, flattened, entirely covered by the overlapping elytra. Prostomium square, with a deep anterior median notch; 4 eyes, 2 tentacles with a large basal part and a filiform tip. A facial tubercle. 13 pairs of elytra, uniform, deeply notched, their surface divided up into polygonal areas and these again into numerous secondary areoles. The posterior margin bears large spinous tubercles. Dorsal setae extremely fine, in dense clusters. Ventral setae stout, with a smooth curved tip.

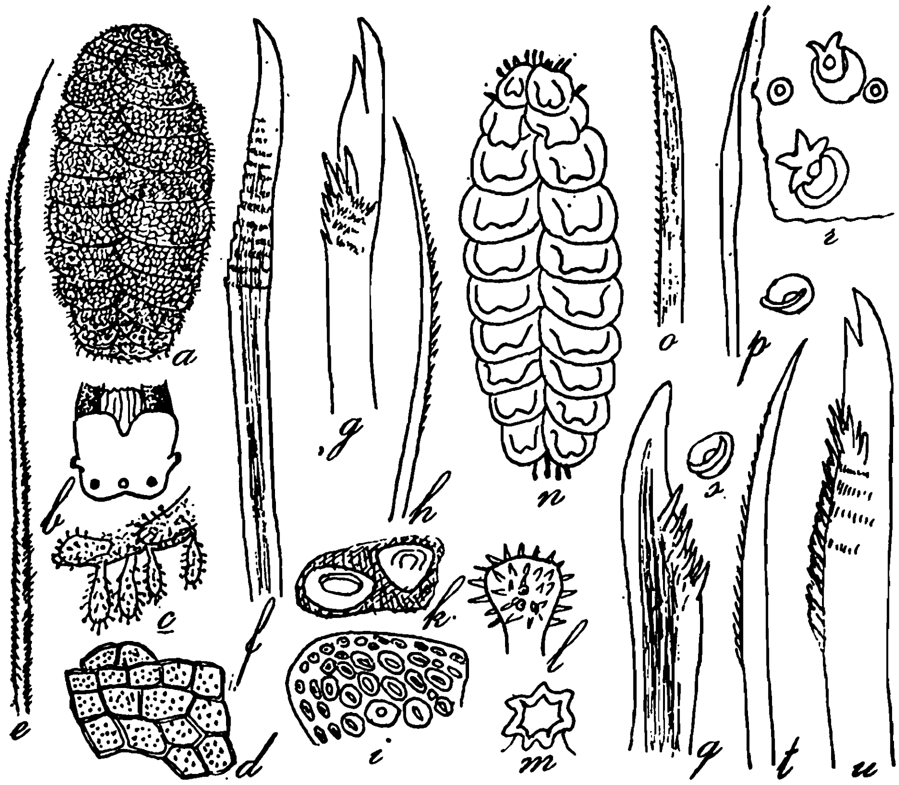


Fig. 13.—*Iphione muricata* Savigny: *a*, dorsal view, slightly enlarged; *b*, head; *c*, lateral papillae of the elytron; *d*, elytron's surface divided into areas; *e*, dorsal and *f*, ventral seta (after Gravier). *Lepidonotus carinulatus* Grube: *h*, *g*, dorsal and ventral bristles, enlarged; *i*, elytron's papillae (after Grube). *L. jacksoni* Kinberg: *k*, carinulate elytron's papillae; *l*, *m*, echinulate and stellate papillae (after Willey). *L. cristatus* Grube: *n*, dorsal view (after Grube). *L. jukesi* Baird: *o*, *p*, two kinds of dorsal setae; *q*, ventral seta; *r*, elytron's papillae (after Pruvot). *L. hedleyi* Benham: *s*, elytron's papillae; *t*, dorsal, *u*, ventral setae (after Pruvot).

Length: 10—20 mm, by 6—10.

Colour: in life, pale fawn with deep blue border. Brown in spirit.

Occurrence: Mergui; Andaman Islands; Ceylon; Maldive Archipelago.

Distribution: Pacific and Indian oceans, the coasts of India, Red Sea.

Genus LEPIDONOTUS Leach.

Body short. Prostomium bilobed. 4 eyes. Paired tentacles short, terminally inserted. Twelve pairs of elytra. Dorsal setae spinous, more slender and shorter than the ventral, which are unidentate or bidentate, with a spinous enlargement at the base of the tip.

Key to the species of Lepidonotus.

1. Without dorsal setae	*melanogrammus* Haswell, p. 37
With dorsal setae ..	2
2. Two kinds of dorsal setae	*jukesi* Baird, p. 37.
One kind of dorsal setae	3
3. Ventral setae bidentate .	4
Ventral setae unidentate	6
4. Elytra fringed .	5
Elytra without fringe	*hedleyi* Benham, p. 35.
5. Elytra with echinulate papillae	*jacksoni* Kinberg, p. 34.
Elytra with carinulate papillae	*carinulatus* Grube, p. 34.
6. Elytra fringed	7
Elytra without fringe, with a tumid more or less bilobed crest	*cristatus* Grube, p. 35.
7. Elytra divided into polygonal areas with star-like papillae	*dictyolepis* Haswell, p. 35.
Elytra without polygonal areas	*tenuisetosus* (Gravier), p. 36.

10. Lepidonotus carinulatus Grube (Fig. 13, g—i).

Lepidonotus carinulatus, Grube, 1878, p. 26, pl. III, fig. 2; Horst, 1917, p. 69, pl. XV, fig. 10: Fauvel, 1919, p. 330; 1932, p. 13; Seidler, 1924, p. 72 (Synonymy): Augener, 1922, p. 8.

Elytra round, next oval and elliptic, fringed, covered with flat or carinulate tubercles. Dorsal setae slender, spinulose; ventral setae stout, bidentate.

Length: 15—30 mm. On coral reefs and shells.

Occurrence: Ceylon, Tuticorin, Pamban, Shingle Island, Kilakarai.

Distribution: Japan, Philippine Islands, Indian Ocean, Persian Gulf, Red Sea, Madagascar.

11. Lepidonotus jacksoni Kinberg. (Fig. 13, *k—m*).

Lepidonotus jacksoni, Kinberg, 1857, p. 11, pl. III, fig. 11; pl. VIII, fig. 48: Augener, 1922a, p. 11; 1927, p. 99: Seidler, 1924, p. 74.

Lepidonotus carinulatus (*non* Grube), Willey, 1905, p. 248, pl. I, fig. 7—11.

Lepidonotus willeyi, Benham, 1915, pl. XXXVIII, figs. 8—15.

Elytra fringed, with flat, carinulate and large spheroidal echinate papillae, dorsal setae slender; ventral setae bidentate. Elytra more conspicuously echinate or stellate than in *L. carinulatus,* but in both species there is a large range of variation in the number and size of the spinous tubercles. Both are also closely allied to *L. squamatus* of Europe.

Occurrence: Port Blair Harbour, Andaman Islands; Ganjam Coast; Ceylon.

Distribution: Pacific Ocean, New Zealand, Australia, Indian Ocean.

12. **Lepidonotus cristatus** Grube. (Fig. 13, *n.*)

Lepidonotus cristatus, Grube, 1878, p. 27, pl. II, fig. 3: Gravier, 1901, p. 270, pl. VII, figs. 104—110: Fauvel, 1919, p. 329, 1932, p. 15: Gravely, 1927, p. 3, pl. I, fig. 2.
Lepidonotus oculatus Baird, Seidler, 1924, p. 43, figs. 3—8.

Elytra soft, large, entirely covering the back: they are rounded or slightly emarginate, without fringe, covered with small stellate tubercles and bearing a large tumid, more or less bilobed crest. Dorsal setae stout, crenulated; ventral setae with a short smooth apex and a few rows of small spines.

Occurrence: Andaman Islands; Gulf of Mannar, Ceylon.

Distribution: Philippine Islands, Amboina, West Australia, Indian Ocean, Mauritius, Zanzibar, Red Sea.

13. **Lepidonotus hedleyi** Benham. (Fig. 13, *s*, *t* and *u*)

Lepidonotus hedleyi, Benham, 1915, p. 181, pl. XXXVIII, figs. 1—7: Seidler, 1924, p. 77: Pruvot, 1930, p. 7, pl. I, figs. 6—10.

Elytra oval, without fringe, smooth in appearance, pale grey, translucent, thin, slightly overlapping, sparsely covered with uniformly arranged low conical tubercles, which have an oval base. Dorsal setae pale, all alike, with incomplete spiral frills. Ventral setae with a subapical tooth and from 9 to 15 pectinate frills. Tentacles smooth. Dorsal cirri stout with a slight subterminal swelling. (Benham)

Length: 20 mm.

Colour: Dorsal cirri brown, with a dark band below the enlarged tip.

Occurrence: Manora shore, Karachi.

Distribution: New Caledonia, South Australia, Indian Ocean.

14. **Lepidonotus dictyolepis** Haswell.

Lepidonotus dictyolepis, Haswell, 1883, p. 287, pl. IX, figs. 7, 8. Seidler, 1924, p. 25: Augener, 1927a, p. 94, fig. 3.

Elytra oval, overlapping, entirely covering the back, and with a thick fringe and cylindrical papillae along

the margins; the surface is divided into polygonal areas, which may bear in their middle a round papilla with star-like diverging ridges and a central pore. Dorsal setae slender and spinulose. Ventral setae stout, with a short unidentate apex and a few spines.

Colour: A black triangular spot pointing forwards on the elytra.

Occurrence: Shingle Island, Gulf of Mannar.

Distribution: India, South Australia.

15. **Lepidonotus tenuisetosus** (Gravier) (Fig. 14, *c*—*f*)

Lepidonotus tenuisetosus, Fauvel, 1919, p. 330; 1930, p. 8; Seidler, 1924, p. 25.

Euphione tenuisetosa, Gravier, 1901, p. 122, pl. VIII, figs. 123—125: Fauvel, 1911, p. 368.

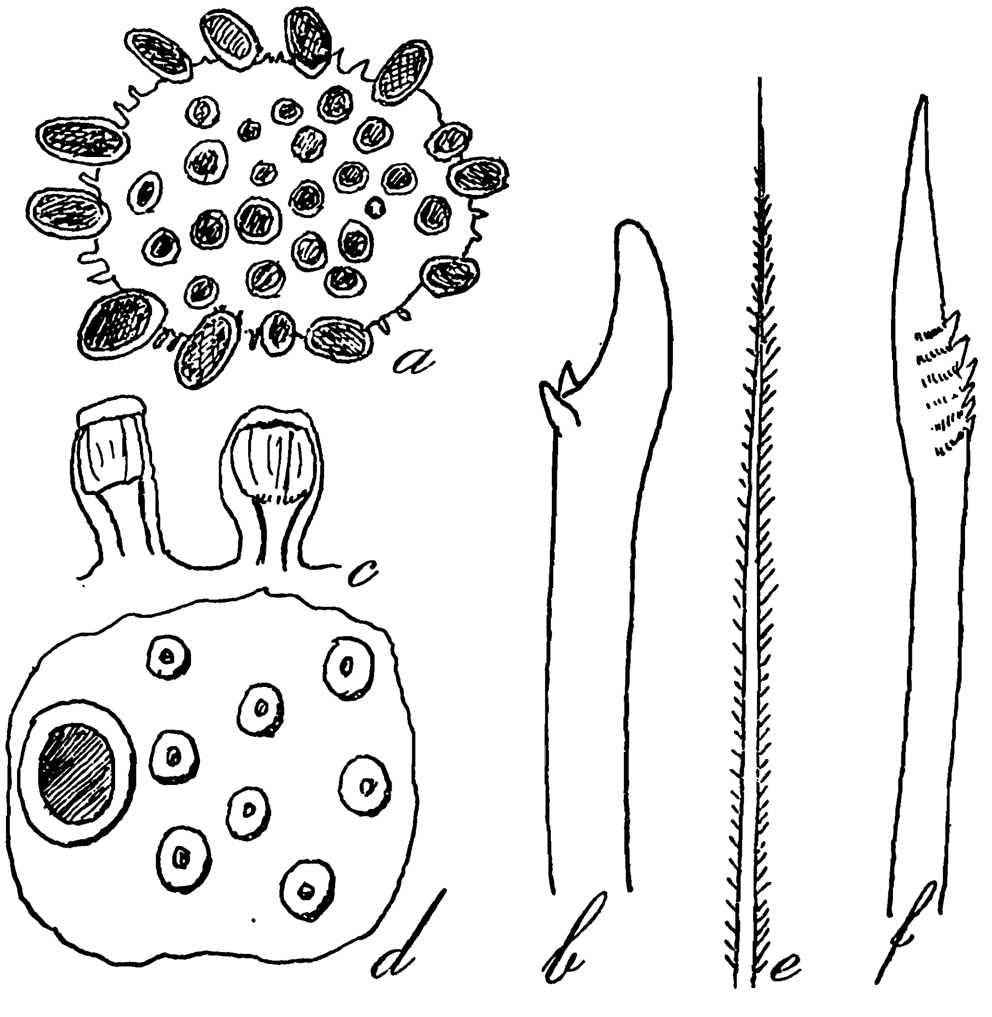


Fig. 14.—*Hermenia acantholepis* (Grube): *a*, elytron, enlarged; *b*, ventral, trifurcate seta. *Lepidonotus tenuisetosus*; *c*, *d*, elytron's papillae; *e*, *f*, dorsal and ventral setae (after Gravier).

Elytra oval, slightly reniform, with a small fringe; covered with a few large and a number of smaller rounded

papillae, and also very small calicinate papillae on the outer edge. Dorsal setae slender, nearly capillary and spinulose. Ventral setae with a rather long smooth tip and a few fringes. Closely allied to *L. squamatus,* differs only in having more slender dorsal setae, smaller tubercles on the elytra and more closely placed eyes.

Length: 15—30 mm.

Occurrence: Jack and Una Islands, Mergui Archipelago; Port Canning; off Puri, Orissa; Madras.

Distribution: Indian Ocean, Persian Gulf, Red Sea, Madagascar.

16. **Lepidonotus melanogrammus** Haswell. (Fig. 9, *a′—e′*)

Lepidonotus melanogrammus, Haswell, 1883, p. 284, pl. VIII, fig. 13: Fauvel, 1917, p. 176, pl. IV, figs. 18-19: Seidler, 1924, p. 84.

Elytra rounded, then oval, overlapping but leaving the middle of the back uncovered. They are smooth, without papillae or fringe, and are divided into polygonal areas. Dorsal ramus reduced to a small conical tubercle, with an aciculum., Ventral setae stout, bidentate, or unidentate in the posterior feet. Dorsal cirri short, with a large cirrophore. Dorsal setae rare or wanting.

Colour: Elytra dark, with two round spots. Dark spots on the ventral surface.

Occurrence: Port Blair, Andaman Islands.

Distribution: Andaman Islands, South Australia.

Sub-genus THORMORA Baird.

Two kinds of dorsal setae.

17. **Lepidonotus (Thormora) jukesi** (Baird). (Fig. 13, *o—r*).

Thormora jukesi, Baird, 1865, p. 199.
Lepidonotus (*Thormora*), *jukesi,* Seidler, 1924, p. 88: Fauvel, 1930, p. 508: Pruvot, 1930, p. 9, pl. I, figs. 11—15.
Lepidonotus trissochaetus, Grube, 1878, p. 25, pl. II, fig. 4: Fauvel, 1919, p. 332 (Synonymy).

Two kinds of dorsal setae: (1) short, curved, spinulose, (2) long, straight, smooth, slightly hastate. Ventral setae unidentate, with a few rows of spines. Elytra tough, rounded, overlapping, but leaving the middle of the back bare. They are destitute of any fringe and bear a few cylindrical, more or less starry, tubercles and smaller rounded ones.

Occurrence: Mergui Archipelago, 3 fms; Andaman Islands.

Distribution: New-Caledonia, Australia, Malay Archipelago, Indian Ocean, Red Sea.

Incertae sedis.

18. **Lepidonotus fusicirrus** (Schmarda).

Lepidonotus fusicirrus, Seidler, 1924, p. 85.
Polynoë fusicirra, Schmarda, 1861, p. 152, pl. XXXVI, fig. 311.

Back convex. Elytra 12 pairs, round, red, with brown and dark spots. Tentacles and cirri smooth, fusiform, brown. Dorsal setae long, capillary, sharp, with a tooth. Ventral setae, broad, with 2-3 spines under the unidentate tip.

Occurrence: Ceylon.

The description is too incomplete for an accurate identification.

Genus HERMENIA Grube.

Body short. Prostomium bilobed. 4 eyes. Tentacles short, inserted terminally. Twelve pairs of elytra, small, not overlapping. Dorsal division of the foot rudimentary. Ventral setae trifurcate.

19. **Hermenia acantholepis** (Grube) (Fig. 14, *a*, *b*).

Hermenia acantholepis, Seidler, 1924, p. 94: Pruvot, 1930, p. 11, pl. I, fig. 27—33.
Lepidonotus acantholepis, Grube, 1878, p. 24, pl. II, fig. 1: Fauvel, 1922, p. 990, fig. 1; 1932, p. 16.

Segments rough and warty. Elytra, with the exception of the first 2-3 pairs, very small, rounded, covered and bordered with large, brown ovoid tubercles and a few cylindrical papillae. Only a few dorsal setae, small, slender, serrated. Ventral setae with two large conical teeth at the base of their large, faintly bent, tip.

Although nearly related to the genus *Lepidonotus* the general appearance of the animal is very striking.

Length: 30 mm by 10 mm.

Colour: uniformly milky with chestnut elytra.

Occurrence: Ceylon.

Distribution: Pacific Ocean, Samoa, New Caledonia, Australia, Annam, Philippine Islands, Malay Archipelago, Indian Ocean, Ceylon, Madagascar.

Genus EUNOË Malmgren.

Prostomium bilobed, with frontal peaks. Lateral tentacles inserted ventrally. Fifteen pairs of elytra, covering the whole body. Dorsal setae stout, with transverse rows of minute spines. Ventral setae unidentate.

20. **Eunoë pallida** (Ehlers). (Fig. 17, *c—g*)

Eunoë pallida, Fauvel, 1931, p. 7, pl. I, figs. 1—5.
Gattyana pallida, Ehlers, 1908, p. 49, pl. I, figs. 1--9.
Harmothoë pallida, Horst, 1917, p. 91.
?*Harmothoë holothuricola,* Izuka, 1912, p. 55, pl. VI, figs. 2—7.

Prostomium bilobed, with two small, short, pointed peaks. Median tentacle with a large, short ceratophore. Lateral tentacles filiform, shorter. 4 small pale-coloured eyes. Elytra 15 pairs, overlapping, large, soft, smooth, unfringed. Dorsal cirri with papillae. Dorsal tubercles present. Both divisions of the feet elongated, pointed. Dorsal setae stout, curved and serrated on the convex side. Ventral setae with a long, faintly spinulose, enlarged part and a smooth unidentate tip. The upper ventral setae are long, slender, straight, nearly capillary.

Parasitic on Echinoderms.

Length: about 30 mm, by 9 mm.

Colour: in spirit brownish.

Remarks: It has sometimes been described with 16 pairs of elytra (Ehlers and Izuka).

Occurrence: Andaman Sea; Travancore; Persian Gulf.

Distribution: Japan (?), Malay Archipelago, Indian Ocean, Persian Gulf.

Genus GATTYANA McIntosh.

Prostomium with frontal peaks. Lateral tentacles inserted ventrally. Fifteen pairs of elytra covering the whole body. Dorsal setae numerous, spinulose, capillary. Ventral setae stout, unidentate.

21. **Gattyana deludens** Fauvel. (Fig. 15, 16).

Gattyana deludens, Fauvel, 1932, p. 18, figs. 1, 2.

Body elongate oval, nearly uniform in breadth, *much flattened;* 36—38 setigerous segments. Prostomium bilobed, frontal peaks blunt, 4 small black eyes. Elongate median tentacle, borne on a large ceratophore. Lateral tentacles filiform, much shorter, ciliated, inserted beneath

the base of the median tentacle. A nuchal fold. Paips tapering. Tentacular cirri and tentacles with clavate

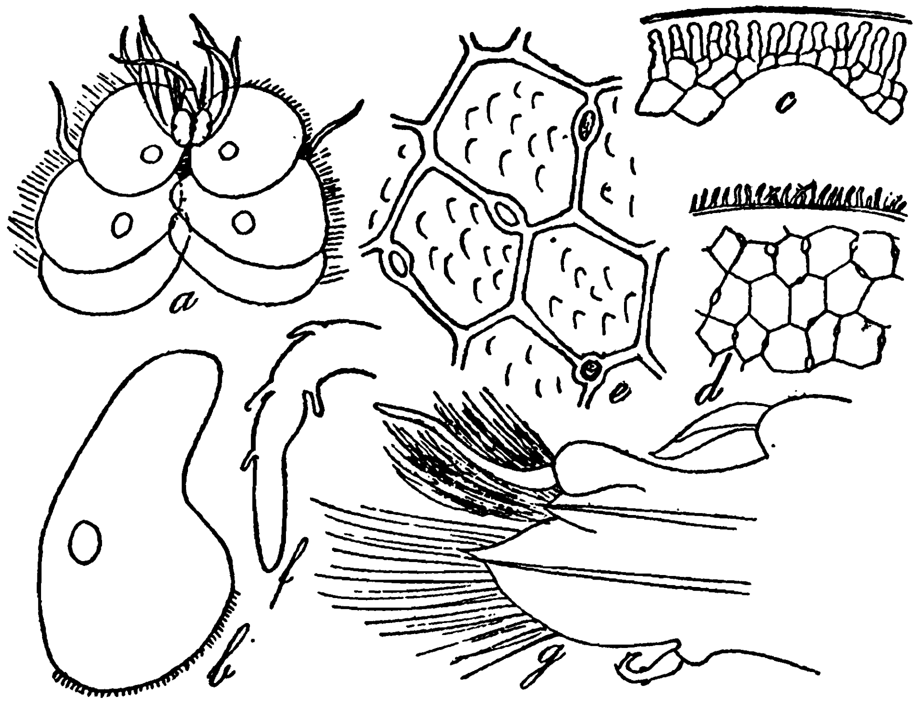


Fig. 15.—*Gattyana deludens* Fauvel: *a*, anterior end, dorsal view, the head is supposed to be seen through the elytra which are really opaque, ×7; *b*, elytron, areolate patterns not figured ×7; *c*, areolate part of the elytron on the smooth border, near the side ×48; *d*, areolate part of the elytron near the fimbriate border ×48; *e*, polygonal areas with raised cuticle and stomatiform spots ×110; *f*, ventral cirrus ×110; *g*, cirrigerous foot ×22.

papillae. Dorsal cirri little exceeding the setae. Ventral cirri short. *Cirrigerous feet provided with a long gill-like dorsal process.* 15 pairs of elytra, yellow, tough, crossing and overlapping, covering the whole body. The first pairs orbicular, next reniform; fringed on the outer edge, upper surface smooth, divided into conspicuous polygonal areas, without any spines or papillae and without any secondary areoles in the meshes. Dorsal ramus small, conical, with an enclosed aciculum and a number of white setae, long, slender, hair-like, with transverse rows of delicate spines and a finely tapering, undulating tip. The superior dorsal setae are shorter, stouter, bent and denticulate. Ventral ramus larger, conical, with an enclosed aciculum and yellowish setae, larger, with a longer spinulose part slightly enlarged and a smooth *unidentate* tip. 2 long papillated anal cirri.

Length: 12—19 mm. by 5—7 mm.

Colour: in spirit: elytra yellow, dorsal setae pale and ventral setae pale yellow.

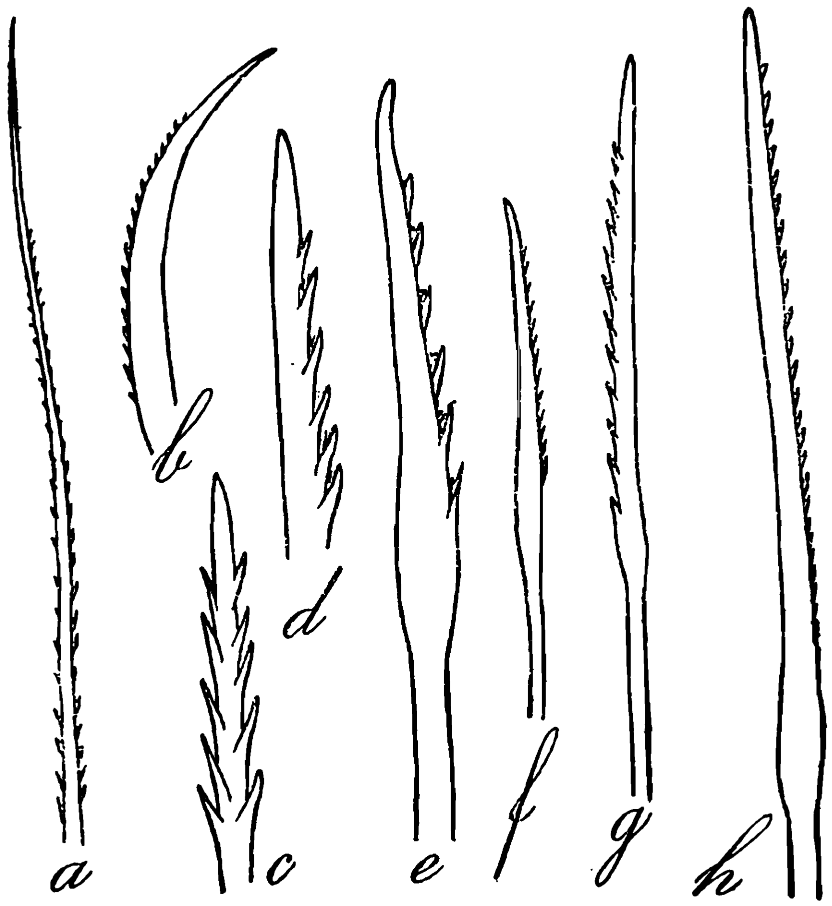


Fig. 16.—*Gattyana deludens* Fauvel: *a*, dorsal bristle ×120; *b*, upper dorsal bristle; *c, d*, tip of upper ventral seta, side and front view ×380; *e*, inferior ventral bristle ×380 *f*, inferior ventral bristle ×150; *g*, median ventral bristle ×150; *h*, upper ventral bristle ×150.

Remarks: This species has externally the appearance of an *Iphione, Iphionella cimex*, but it is really a *Gattyana. Harmothoë iphionelloides* Johnson (1901), which is also a *Gattyana*, is a closely allied species.

Occurrence: Annam; Poulo Condore, Mergui Archipelago; Gangetic Delta, Ghandipore; Balassore, Orissa; Pondicherry, Madras.

Genus LAGISCA Malmgren.

Head as in *Harmothoë*, with lateral tentacles inserted ventrally. Fifteen pairs of elytra, leaving the posterior segments of the body uncovered. Dorsal setae stout, ventral setae bidentate.

22. Lagisca flaccida Potts. (Fig. 18, a—c)

Lagisca flaccida, Potts, 1909, p. 339, pl. XVII, fig. 11, pl. XXI, figs. 49—50; Horst, 1917, p. 94.

Body much flattened, breadth fairly uniform, tapering slightly just before the posterior end. Head hexagonal, with small distinct eyes and two tiny lateral peaks. Median tentacles long; lateral tentacles shorter, sparsely ciliate. A slight nuchal fold behind the head. Elytra soft, gelatinous, with the margins entire; the inner half covered with tiny tubercles. Dorsal setae with acute tip and a rather long smooth portion between it and the spiniferous area. Ventral setae long, with rather short spiniferous area and a short, rather blunt, spine under the incurved apex.

Length: 20 mm, by 6 mm.

Colour: in spirit: elytra white.

Occurrence: Ceylon.

Distribution: Malay Archipelago; Indian Ocean, Ceylon, Zanzibar.

Genus HARMOTHOE Kinberg.

Prostomium bilobed, often with lateral peaks. 4 eyes. Lateral tentacles inserted ventrally. Fifteen pairs of scales, covering the whole dorsum. Dorsal setae stouter than the ventral, which are bidentate.

Key to the species of Harmothoë.

1. Elytra without fringes	2
Elytra fringed ..	3
2. Elytra with tiny tubercles	*minuta* (Potts), p. 45.
Elytra smooth	*arabica* Monro, p. 46.
3. Elytra divided into polygonal areas with bifurcate tubercles	*dictyophora* (Grube), p. 44.
Elytra not divided into polygonal areas	4
4. Elytra densely covered with sharp spines	*indica* (Kinberg), p. 47.
Elytra with conical tubercles	5
5. Elytra divided crosswise into 2 pale and 2 dark areas	*boholensis* (Grube), p. 47.
Elytra with conical tubercles and a posterior row of large papillae	6
6. Ventral lamellae conspicuous	*ampullifera* (Grube), p. 43.
Without ventral lamellae	*imbricata* (Linn.), p. 42.

23. Harmothoë imbricata (Linn.) (Fig. 19).

Harmothoë imbricata, Fauvel, 1923, p. 55, fig. 18, f–l: Gravely, 1927, p. 4, pl. IX, fig. 4.

Prostomium bilobed, with frontal peaks. 4 eyes, the anterior pair partly under the frontal peaks. Lateral

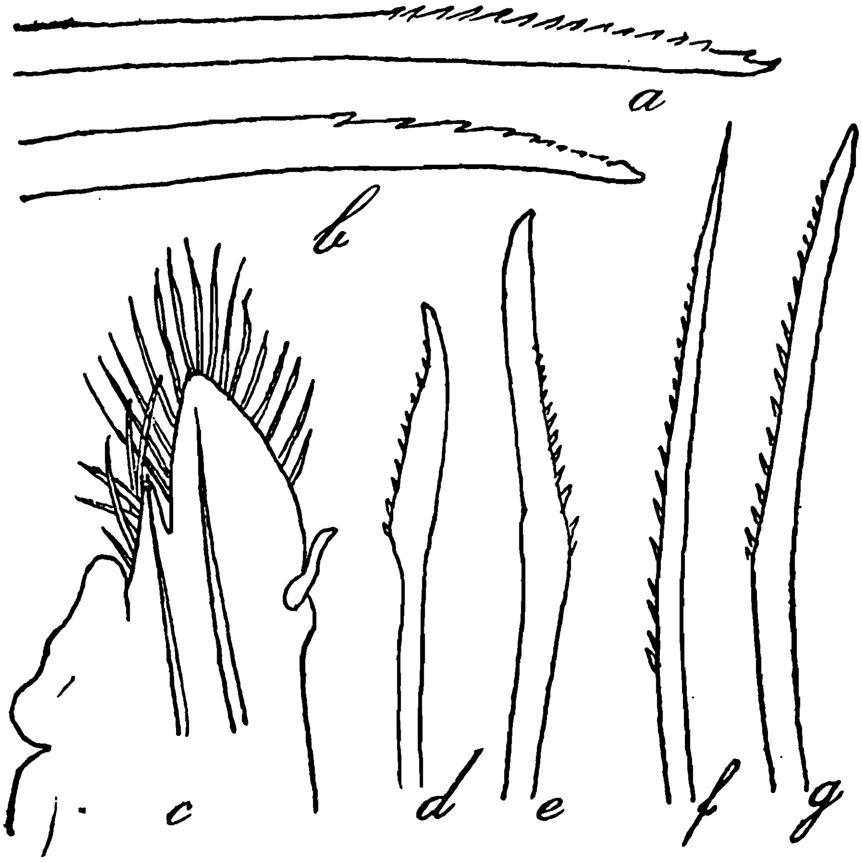


Fig. 17.—*Harmothoë minuta* (Potts): *a, b,* ventral and dorsal setae. *Eunoë pallida* (Ehlers): *c,* foot ×30; *d,* inferior; *e,* median and *f,* superior ventral setae ×140; *g,* dorsal seta ×140.

tentacles very short and slender. Tentacles and cirri papillated. 15 pairs of elytra, oval-reniform, sparsely fringed, with small conical tubercles and, often, a row of large globular papillae on the posterior border. Dorsal setae stout, slightly curved, serrated, with a smooth apex. Ventral setae spinulous, curved, the apex of which is smooth, bidentate with the secundary tooth curved outwards.

Length: 30—40 mm; by 10 mm.

Colour: very variable, rather dark, sometimes pale with brown streaks.

Occurrence: Krusadai Island.

Distribution: North Pacific, Japan, Petchili; Indian Ocean; Mediterranean Sea; Atlantic Ocean; Arctic Seas.

24. Harmothoë ampullifera (Grube) (Fig. 18, *d*)

Harmothoë ampullifera, Fauvel, 1911, p. 368; 1932, p. 22.
Polynoë ampullifera, Grube, 1878, p. 35, pl. III, fig. 5.

Lepidonotus ampulliferus, Gravier, 1901, p. 214, pl. VII, figs. 111—113.
Paralepidonotus ampulliferus, Horst, 1917, p. 76.

Prostomium without frontal peaks, tentacles and cirri papillated. Lateral tentacles inserted somewhat

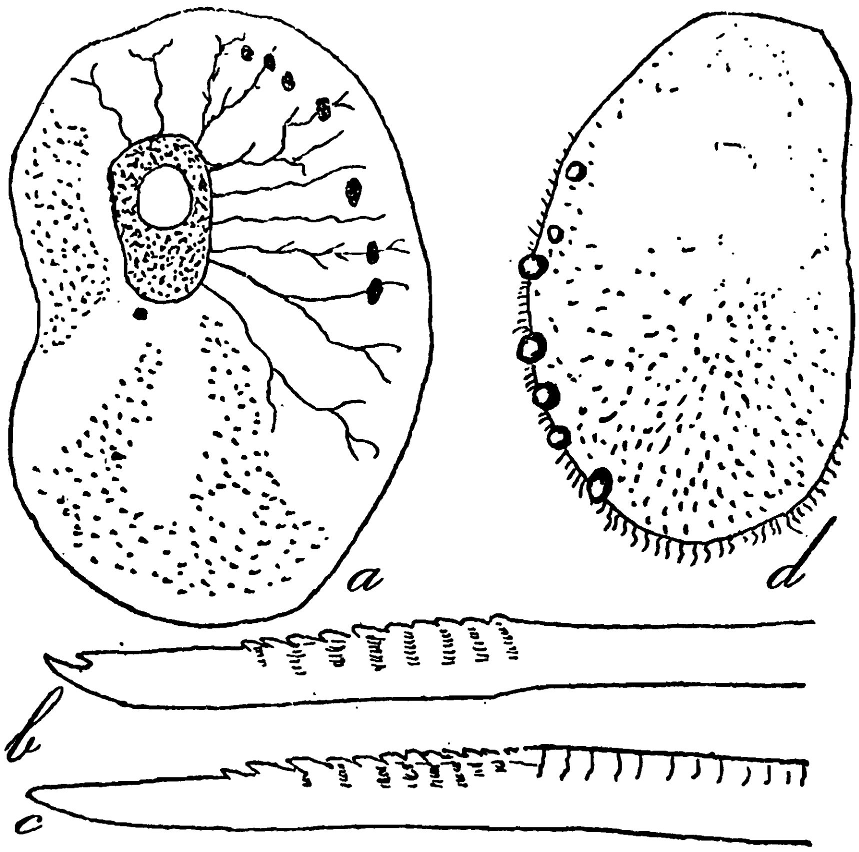


Fig. 18.—*Lagisca flaccida* (Potts): *a*, posterior elytron; *b*, dorsal seta from the 6th segment ×340; *c*, ventral seta of the 22nd segment ×340 (after Potts). *Harmothoë ampullifera* (Grube); *d*, elytron (after Gravier).

ventrally. Elytra fringed, with small papillae and large vesicles in concentric rows. Dorsal setae arching, verticillate spinulose. Ventral setae bidentate. Long nephridial papillae and *conspicuous ventral lamellae*. Closely related to *H. imbricata*.

Length: 20—30 mm.

Occurrence: Singapore, Camorta Island, Rameswaram and Pamban coral reefs.

Distribution: Philippine Islands; Annam; India; Persian Gulf; Red Sea.

25. Harmothoë dictyophora (Grube) (Fig. 20, *a—b, m.*)

Harmothoë dictyophora, Willey, 1905, p. 251, pl. I, figs. 14—16; Fauvel, 1911, p. 370; 1932, p. 22; Gravely, 1927, p. 4.
Polynoë dictyophora, Grube, 1878, p. 44, pl. XV, fig. 9.

Tentacles and cirri papillated. 15 pairs of elytra covering the back. They are divided into polygonal areas carrying chitinous spines, simple or bifurcated, and filiform papillae. Dorsal setae numerous, verticillate, spinulose. Ventral setae conspicuously bidentate. Very closely allied to *H. areolata* of Europe.

Length: 20–25 mm.

Occurrence: Ganjam Coast, Madras Presidency; Kilakarai, from coral reefs.

Distribution: Australia; Malay Archipelago; Annam; Bay of Bengal; Ceylon; Red Sea; Persian Gulf; Madagascar.

26. Harmothoë minuta (Potts) (Fig. 17*a–b*).

***Polynoë* (?) *minuta*, Potts, 1919, p. 337, pl. XIX, fig. 12, pl. XX, fig. 31, pl. XXI, figs. 42, 43.**
***Lagisca minuta*, Horst, 1917, p. 97.**

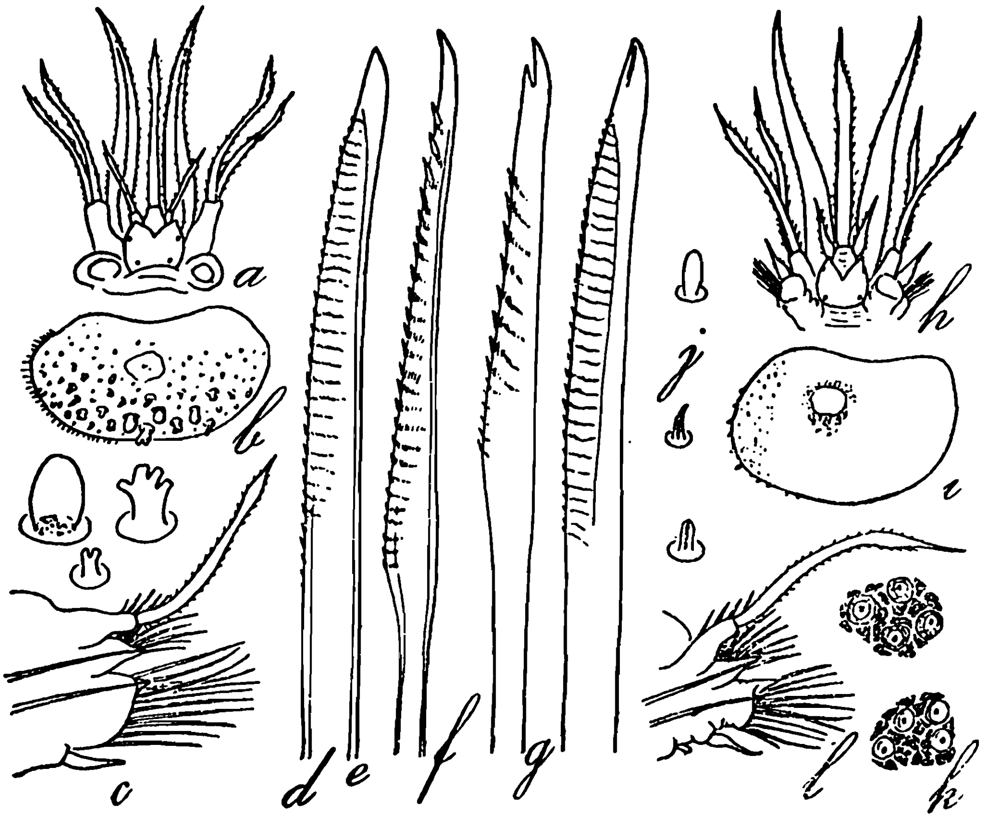


Fig. 19.—*Harmothoë imbricata* Linn.: *f*, ventral seta ×100; *g*, dorsal seta ×100; *h*, head, enlarged; *i*, elytron; *j*, *k*, elytron's papillae; *l*, foot.
[*a–e* refer to *Eunoë nodosa* not from India.]

Prostomium bilobed, with acute frontal peaks. 4 very small eyes. Lateral tentacles very minute and slender. 15 pairs of elytra, almost circular, translucent, with entire margin, smooth surface with delicate veins and occasional tiny chitinous tubercles. Dorsal setae broad,

slightly curved with a rather blunt apex and serrations near the tip. Ventral setae numerous, with apex rather faintly serrated. Ventral setae numerous, with apex rather faintly serrated near the tip, not bearing recognisable spines; upper setae with a very long serrated region, a short incurved tip and projecting tooth just under it.

Commensal on Crinoids.

Length: 5 mm by 1.5 mm.

Colour: Dark red or black.

Occurrence: Port Blair, Andaman Islands.

Distribution: Andaman Sea; Maldive Archipelago; Red Sea; Suez.

27 Harmothoë arabica Monro. (Fig. 20, *c—g*).

Harmothoë arabica, Monro, 1937, p. 257, fig. 5.

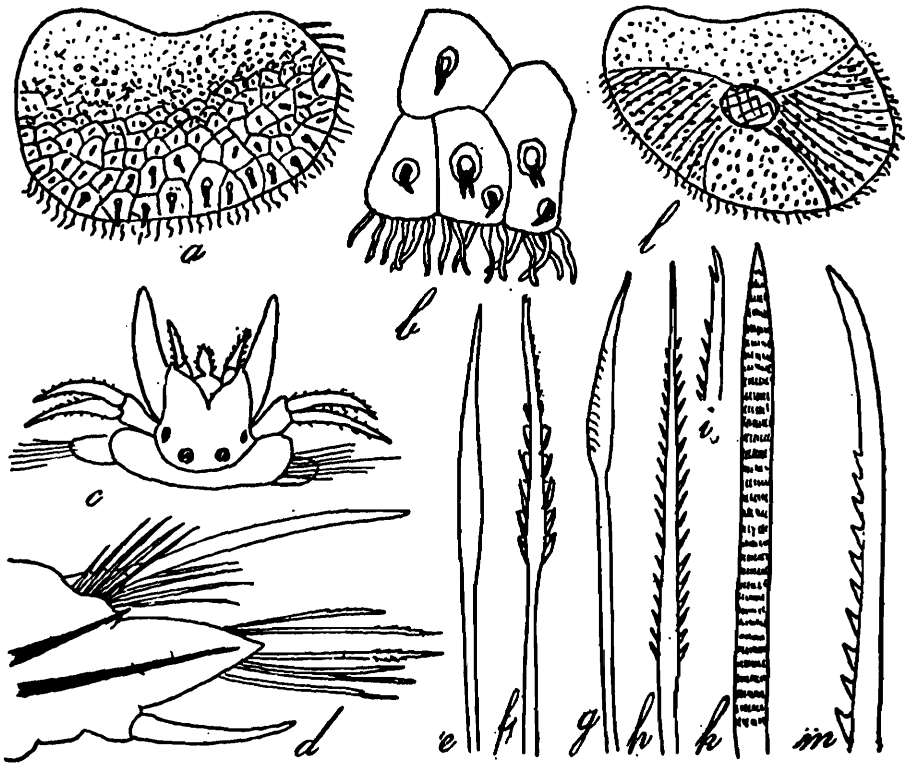


Fig. 20.—*Harmothoë dictyophora* (Grube): *a*, elytron; *b*, elytron's marginal papillae, much enlarged; *m*, medio-dorsal seta. *H. arabica* Monro; *c*, head; *d*, foot; *e*, dorsal bristle; *f*, middle ventral seta; g, lower ventral seta (after Monro). *H. indica* Kinberg: *h, i*, ventral setae; *k*, dorsal seta (after Kinberg). *H. boholensis* (Grube); *l*, elytron, enlarged.

Prostomium bilobed, with acute frontal peaks. 4 small eyes, the anterior pair on the sides of the head.

Median tentacle very short, piriform. Lateral tentacles stout. Subulate palps slightly longer. Tentacles and tentacular cirri papillated. 15 (?) pairs of elytra, round, smooth, with two patches of brown pigment. Dorsal bristles slender, slightly curved and quite smooth. Upper ventral bristles long, slender, unidentate and smooth; middle ones slender, spinous, faintly bidentate; lower ones shorter, faintly denticulated, with tip either simple or faintly notched. Differs from most *Harmothoë* in having dorsal and upper ventral setae smooth.

Length: 7 mm. by 1 mm. 36 setigerous segments, ripe female.

Occurrence: Maldive area.

28. **Harmothoë indica** (Kinberg) (Fig. 20, *h—k*)

Harmothoë indica, Augener, 1922, p. 6, fig. 2; 1926, p. 442.
Lepidonotus indicus, Kinberg, 1857—1910, p. 15, pl. IV, fig. 19.
Lagisca indica, Potts, 1910, p. 338.

Prostomium without frontal peaks. Tentacles and cirri slender, papillated. Lateral tentacles inserted somewhat ventrally. A distinct nuchal fold. Elytra oval, entirely covering the back, overlapping considerably, firm, with granular appearance, with a broad crescentic mark of black pigment, covered densely with short, sharp spines and intermediately placed cilia and with short cilia on posterior and outer borders. Dorsal setae long, straight, anteriorly pointed, with numerous rows of spines. Ventral setae slender, with acute incurved tip, with a long slender spine situated just under it.

Length: 20 mm. by 7 mm.

Occurrence: Ceylon.

Distribution: East Indies, Banka Strait; Ceylon; Chagos Archipelago, Salomon Island; Amirante Islands, 280 fms.

29. **Harmothoë boholensis** (Grube). (Fig. 20 *l*)

Harmothoë boholensis, Fauvel, 1911, p. 369; 1919, p. 332.
Polynoë boholensis, Grube, 1878, p. 41, pl. III, fig. 4.
Paralepidonotus boholensis, Horst, 1917, p. 77, pl. XVIII, figs. 1-2.

Prostomium bilobed, with frontal peaks. 4 small eyes, the anterior pair slightly lateral. Median tentacle longer than the lateral which are shorter than the palps. Tentacles papillated, dark brown, faintly enlarged under the filiform tip. 15 pairs of elytra, first rounded, then

oval and next reniform, fringed, with conical or blunt tubercles and *divided crosswise into two pale and two dark areas*. Dorsal setae numerous, stout, verticillate, spinulose. Ventral setae bidentate. Nephridial papillae and ventral lamellae variably conspicuous.

Length: 30–35 mm. by 11 mm.

Colour: the dark maltese cross of the elytra is preserved in spirit.

Occurrence: Persian Gulf.

Distribution: Philippine Islands; Annam; Malay Archipelago; Persian Gulf; Red Sea; Madagascar.

Incertae sedis

30. Harmothoë sinagawensis (*non* Izuka), Fauvel, 1932, p. 23, Fig. 3, pl. I, Fig. 1-2. (Fig 21, *a, b*)

Under this doubtful name I have described a broken Polynoid, incomplete posteriorly. The elytra that remain

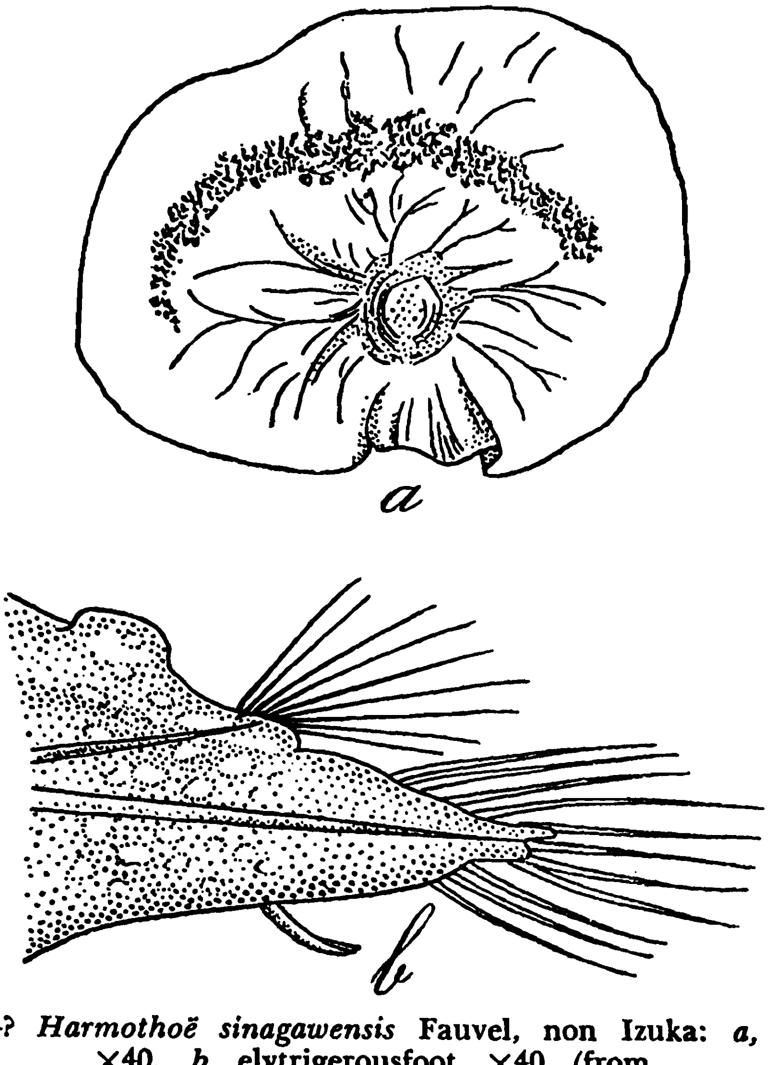


Fig. 21.—? *Harmothoë sinagawensis* Fauvel, non Izuka: *a*, elytron, ×40. *b*, elytrigerousfoot, ×40 (from Fauvel, 1932).

are white with a transverse black streak, soft, destitute of fringe or tubercles. Tentacles and cirri papillated. The lateral tentacles, short, nearly piriform, are subterminally inserted, somewhat as in *Halosydna*. The feet are long and tapering, with a dense cluster of very slender long capillary dorsal setae. The upper ventral setae are long, straight and spinous, the inferior ones have a short enlarged part with only few spines and a long smooth unidentate tip. Owing to the absence of the posterior part, the genus remains doubtful. I have since had the opportunity to observe *H. sinagawensis* specimens from Japan, which is a different species, with two kinds of dorsal setae and 16 pairs of elytra.

Occurrence: Rameswaram Island, Madras Presidency.

Genus SCALISETOSUS McIntosh.

Body long, very brittle. Prostomium without frontal peaks. 4 eyes, three tentacles, the lateral ones inserted ventrally. Fifteen pairs of elytra: thin, delicate, pellucid, not covering the whole body. Setae having the transparency of crystal. Dorsal setae, faintly curved, with some blunt spines on the convex border. Ventral setae hooked, bidentate with rows of semilunar cusps.

Key to the species of Scalisetosus.

Ventral setae bidentate	*pellucidus* Ehlers, p. 49.
Ventral setae unidentate	*longicirrus* Schmarda, p. 50.

31. Scalisetosus pellucidus Ehlers. (Fig. 23, *a–f*).

Scalisetosus pellucidus, Fauvel, 1923, p. 74, fig. 27 (Synonymy); 1932, p. 24.

Scalisetosus spec., Horst, 1917, p. 10, pl. XXI, figs. 8–10.

Body of moderate length. Elytra and cirri very easily detached. The anterior pair of eyes larger and wide apart. Tentacles and cirri with filiform tip and clavate papillae. Elytra round or oval, very transparent and delicate, with small cylindrical or clavate papillae; not fringed. Dorsal setae shorter than the ventral ones, curved, with several cusps on the convex side, and tip faintly bifid. Ventral setae with a short enlargement, a semilunar cusp, or spinous pouch, and a bidentate tip. On Echinoderms.

Length: 12–30 mm.

Colour: Body translucent, yellowish, with a chequered brown pattern on the back. Elytra dotted with white, yellow, pink or purple.

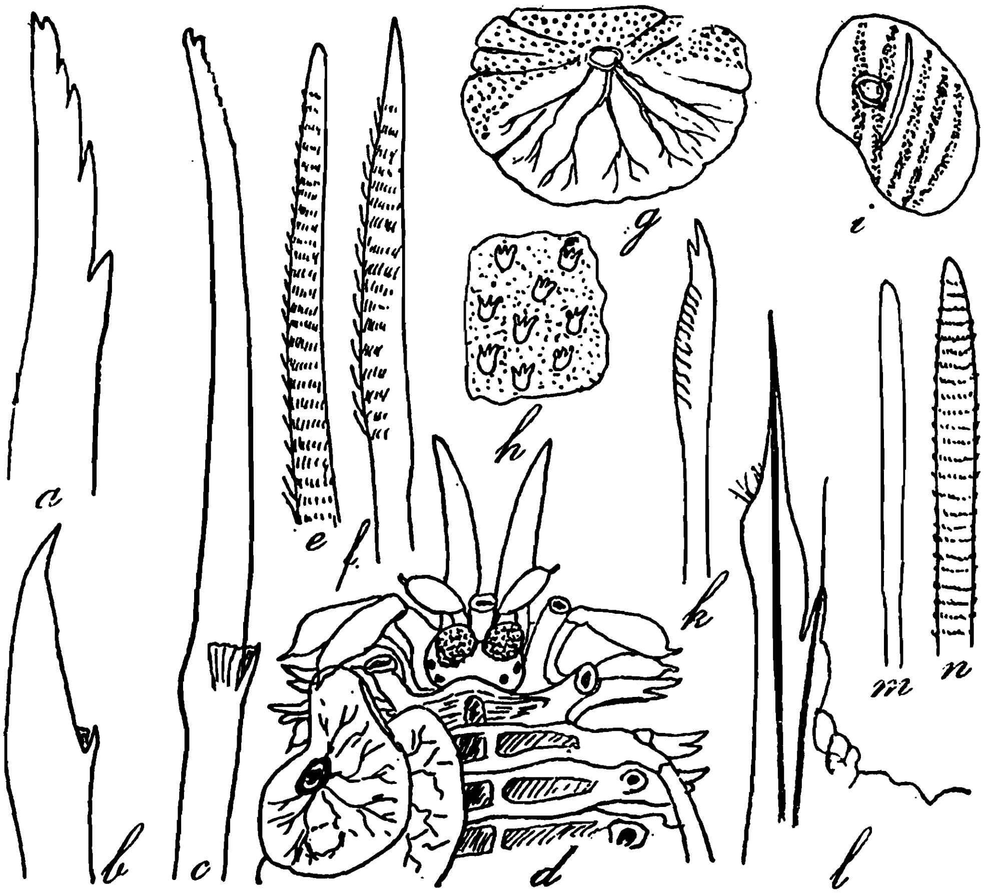


Fig. 22.—*Scalisetosus longicirrus* (Schmarda): *a*, dorsal seta ×363; *b*, inferior ventral seta ×363; *c*, superior ventral seta ×363 (after Marenzeller). *Gastrolepidia clavigera* Schmarda: *d*, head and first segment ×9; *e*, dorsal seta ×148; *f*, median ventral seta ×148; *Allmaniella ptycholepis* (Grube): *g*, elytron ×20; *h*, elytron's papillae, much enlarged (after Grube). *Hyperhalosydna striata* (Kinberg): *i*, elytron ×8 (after Grube); *k*, ventral seta. *Admetella longipedata* McIntosh: *l*, 28th foot ×6; *m*, flattened seta ×78; *n*, ventral seta ×390 (after Ehlers).

Occurrence: Port Blair, Andaman Islands; Kilakarai, S. India; Maldive Archipelago.

Distribution: Annam; Malay Archipelago; Bay of Bengal; Arabian Sea; Mediterranean Sea; Atlantic Ocean.

32. Scalisetosus longicirrus (Schmarda). (Fig. 22, *a—c*)

Scalisetosus longicirrus, Marenzeller, 1902, p. 574, pl. III, fig. 10.
Polynoë longicirra, Schmarda, 1861, p. 152, pl. XXXVI, fig. 309.
Polynoë crinoidicola, Potts, 1910, p. 337, pl. 18, fig. 10, pl. 21, figs. 39—41.
? *Halosydna ceylonica*, Willey, 1905, p. 250, pl. I, figs. 12—13.

Body long, extremely fragile. Prostomium composed

of two distinct halves. 2 pairs of eyes, the anterior pair lateral. Lateral tentacles inserted ventrally, slender and short. Elytra circular, smooth save for very minute tubercles, red or colourless in spirit (black when alive), covering the back, easily detached. Dorsal cirri long. Dorsal setae sabre-like, broad, slightly curved, with 2—3 serrations on the convex side under the acute tip. Ventral setae with a semi-lunar cusp, apex incurved, with a small tooth; ventralmost setae stouter, with sharp incurved unidentate apex. All setae with the transparency of crystal. Commensal on *Astropecten* and Crinoids.

Length: 13 mm.

Remarks: Though Willey attributes 24 pairs of elytra to his species, his description and figures fit very well with *Scalisetosus longicirrus*. As the elytra were all wanting on his specimen he may have made an error regarding the number of elytra bearing segments.

Occurrence: Ceylon; Maldive Archipelago.

Distribution: Japan; Indian Ocean.

Genus GASTROLEPIDIA Schmarda.

More than 21 pairs of elytra, the arrangement of the posterior pairs irregularly alternating with the cirri. Tentacles and cirri club-like, with a filiform tip. *The sternum of the segments is provided with a foliaceous appendage on each side.*

33. Gastrolepidia clavigera Schmarda. (Fig. 22, *d—f*)

Gastrolepidia clavigera, Schmarda, 1861, p. 159, pl. XXXVII, fig. 315: Willey, 1905, p. 258: Potts, 1909, p. 341: Horst, 1917, p. 84, pl. XVI, fig. 5: Seidler, 1924, p. 142, figs. 19, 20: Fauvel, 1919, p. 335; 1932, p. 25; 1942, p. 25: Pruvot, 1930, p. 13, pl. I, figs. 16—19.
Gastrolepidia amblyphyllus, Grube, 1878, pl. III, fig. 7.

Prostomium without frontal peaks. Lateral tentacles inserted ventrally. Tentacles and dorsal cirri long and much enlarged distally, with a small filiform tip. Elytra soft, without fringe or tubercles, semi-transparent, covering the whole back. Dorsal setae few, stout, slightly curved and spinulose. Ventral setae with unidentate tip. Ventral lamellae very large and conspicuous. Ectoparasitic on Holothurians.

Length: 25—30 mm.

Colour. Elytra all black or mottled dark brown and white.

Occurrence: Andaman and Nicobar Islands; Ceylon; Rameswaram Island; Maldive Archipelago.

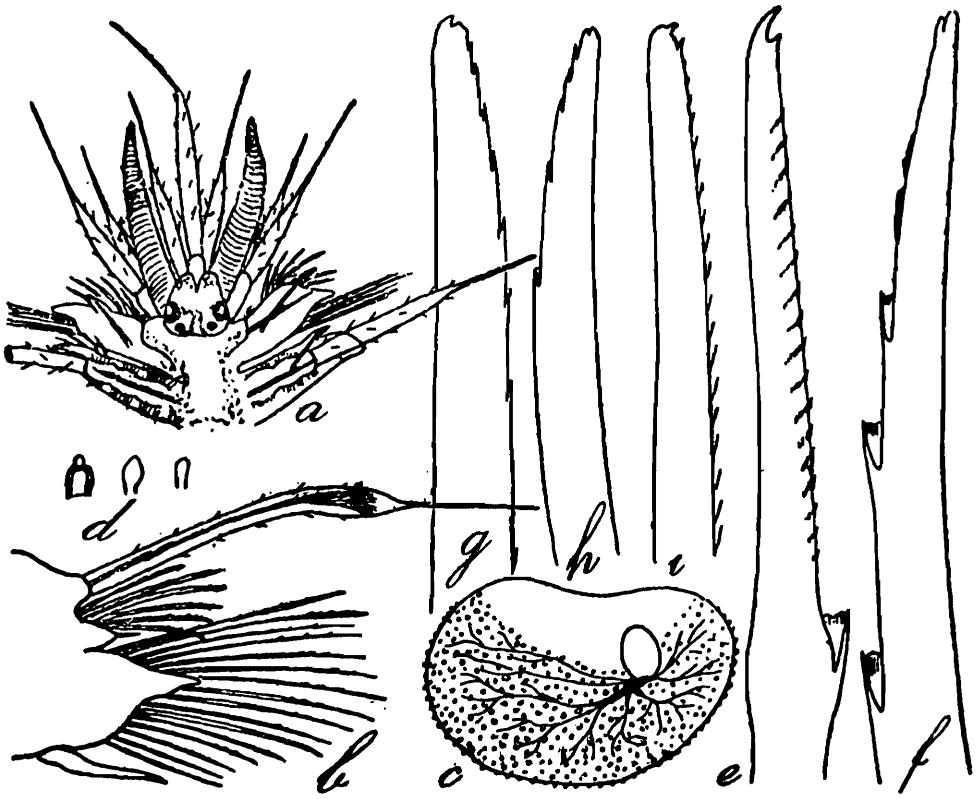


Fig. 23.—*Scalisetosus pellucidus* Ehlers: *a*, head, enlarged (after Claparède), *b*, foot ×20; *c*, elytron ×12; *d*, elytron's papillae ×109; *e*, ventral seta ×310; *f*, dorsal seta ×310 (after McIntosh); *g*. *h*, *i*, *Sc.* *assimilis*.

Distribution: Pacific Ocean, New Caledonia, New Zealand; Indian Ocean, Bay of Bengal, Ceylon, Madagascar, Zanzibar.

Genus HYPERHALOSYDNA Augener.

About 50 segments. More than 18 pairs of elytra. Lateral tentacles inserted terminally. Dorsal setae few or absent. Ventral setae bidentate. Without ventral lamellae.

34. Hyperhalosydna striata (Kinberg) (Fig. 22, *i*—*k*).

Hyperhalosydna striata, Seidler, 1924, p. 136 (Synonymy): Fauvel, 1932, p. 26.
Halosydna fulvovittata, Horst, 1917, p. 80.
Polynoë fulvovittata, Grube, 1878, p. 33, pl. III, fig. 1.
Polynoë platycirrus, McIntosh, 1885, p. 111, pl. III, fig. 4.
Lepidonotus striatus, Kinberg, 1857, p. 14, pl. IV, fig. 18.
Halosydna striata, Monro, 1924, p. 41, fig. 4.

Lateral tentacles as in *Lepidonotus*. Elytra 21-22 pairs, oval, with longitudinal dark stripes and 1-2 keels near posterior edge. Dorsal division of the foot reduced to a small process with only a few short, curved, serrated setae, often wanting. Ventral setae all alike and bidentate.

Colour: Four or five longitudinal brown stripes on the elytra.

Occurrence: Andaman Islands.

Distribution: Japan; Australia; Malay Archipelago; Indian Ocean.

Genus ALLMANIELLA McIntosh.

Prostomium bilobed, with four large eyes. Lateral tentacles terminal. Fifteen (or more) pairs of elytra. Dorsal setae stouter than the ventral, which are bidentate.

35. Almaniella ptycholepis (Grube) (Fig. 22, *g—h*)

Almaniella ptycholepis, Horst, 1917, p. 79, pl. XXII, figs. 6—9; Seidler, 1923, p. 151; Fauvel, 1932, p. 26.
Polynoë ptycholepis, Grube, 1878, p. 39, pl. II, fig. 6.

Head broader than long, divided into two rounded lobes with four large black eyes. Median tentacle long and slender, inserted on a ceratophore between the two lobes. Lateral tentacles filiform, shorter than the median and inserted on the frontal border. Palps twice as long as the lateral tentacles. Elytra 15—17 pairs, large, soft, translucent, smooth and without fringe. Parapodia with a long pointed ventral lobe. Dorsal lobe with a few setae, stout, curved, blunt, smooth, or very finely serrated. Upper ventral setae slender, nearly smooth, unidentate; median and lower setae enlarged, bidentate, nearly smooth or very finely serrated. Dorsal cirri long and slightly enlarged under the tip. Dorsal tubercles present. The shape of the head is very characteristic.

Colour: Back striped brown and white, head brown.

Occurrence: Andaman and Nicobar Islands, Nankauri Harbour.

Distribution: Philippine Islands; Malay Archipelago; Bay of Bengal.

Genus ADMETELLA McIntosh.

Body elongated, with 75 segments. 30 pairs of elytra. Head with the lateral corners elongated, triangular. Eyes absent (?) Both lobes of the parapodia with

an elongated distal extremity. Bristles long, vitreous (Horst).

36. Admetella longipedata McIntosh. (Fig. 22, *l*—*n*)

Admetella longipedata, McIntosh, 1885, p. 124, pl. XIV, fig. 5, pl. XX, fig. 6, pl. XIIA, fig. 17: Augener, 1906, p. 123: Ehlers, 1908, p. 40, pl. II, figs. 10, 11, pl. III, figs. 1—5: Horst, 1917, p. 101: Seidler, 1923, p. 153: Fauvel, 1932, p. 27.

Prostomium with two rounded lobes and two thin triangular processes. Lateral tentacles inserted under the prostomial lobes. Eyes absent. Elytra 24—30. Parapodia very long, ending in a slender tip. Dorsal and ventral setae long, delicate, translucent, flattened out in their distal part, finely serrated along both edges and ending in a smooth elongated tip. Nephridial papillae very conspicuous.

Length: 50—60 mm by 28 mm.

Colourless in spirit.

Occurrence: Andaman Sea, 279—569 fms.

Distribution: Andaman Sea, Pater Noster Island; Indian Ocean, Somali Coast; West Indies.

Genus DRIESCHIA Michaelsen.

Body short with about 28 setigerous segments. Head and tentacles as in the genus *Lepidonotus;* lateral tentacles inserted terminally. Elytra thirteen pairs, on the segments 2, 4, 5, 7 .21, 23 and 26. Parapodia sesquiramous. Dorsal ramus reduced to an aciculum and a small achaetous lobe. Ventral ramus with an aciculum and setae of two kinds. Setae of the first kind very slender, long, capilliform; other setae stouter, enlarged, and ornamented beneath the pointed tips.

37. Drieschia pelagica Michaelsen. (Fig. 24).

Drieschia pelagica, Michaelsen, 1892, p. 6, figs. 15—18: Seidler, 1923, p. 173: Fauvel, 1932, p. 28; 1939, p. 260.
Nectochaeta caroli, (*non* Fauvel), Monro, 1937, p. 261.

Prostomium divided into two long rounded lobes, with four small eyes, the anterior pair lateral. The three tentacles are slender, with short ceratophores; the median is twice as long as the lateral ones; they are inserted terminally, somewhat resembling those of *Halosydna*. The palps are curved and thick. The two pairs of tentacular cirri are equal and elongated. Elytra small, rounded, soft, translucent, with a few yellow grains, but without a fringe. Dorsal cirri very variable in length but with en-

ormous *cirrophores*. Feet long, ending in two unequal triangular lips. Ventral cirrus filiform, shorter than the

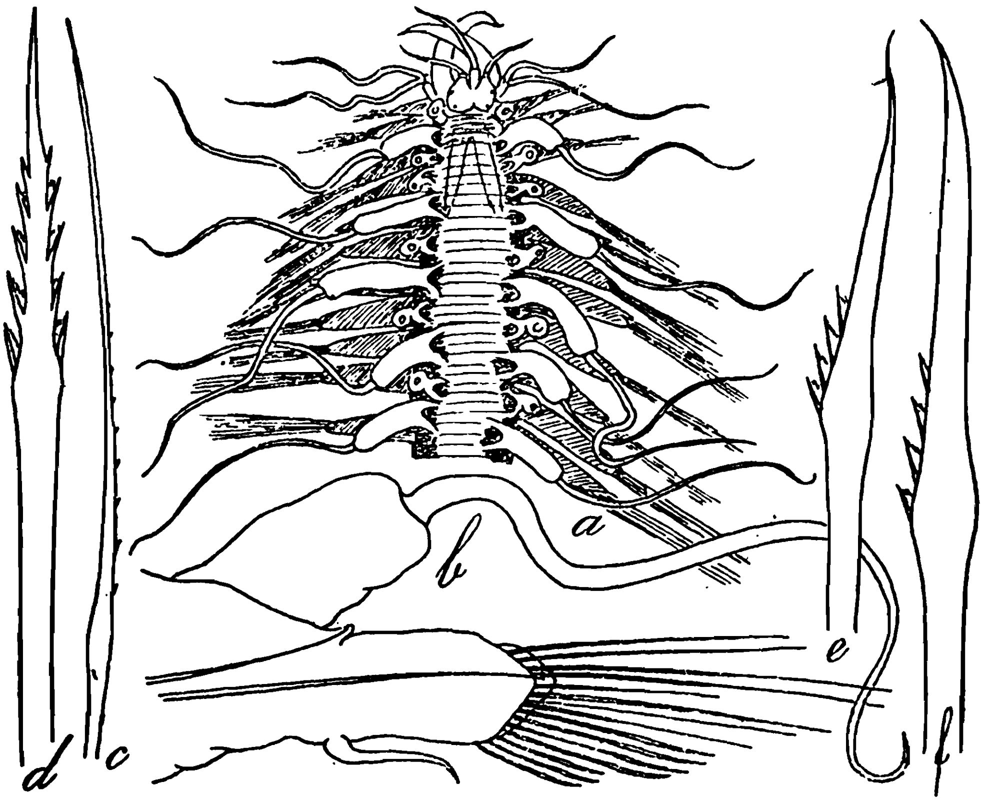


Fig. 24.—*Drieschia pelagica* Michaelsen; var. *caroli*: *a*, anterior region ×5; *b*, foot×16; *c, d, e, f*, ventral setae, upper one ×109; middle ones, front and side view ×187.

foot. Dorsal setae absent. A dorsal aciculum and a small rudimentary knob. Ventral setae very long and slender accompanied by 2—4 much shorter and stouter setae with a short enlargement under the tip and a few rows of spines.

Length: 5—10 mm by 2—5 mm.

Colourless, translucent, pelagic.

Remarks: *Nectochaeta caroli* Fauvel is but an Atlantic variety of *Drieschia pelagica* with still larger cirrophores and more conspicuous dorsal knob.

Occurrence: Gulf of Oman; Ceylon; Bay of Bengal.

Distribution: Indo-China; Indian Ocean.

Genus NECTOCHAETA Marenzeller.

Body short, 15—35 setigerous segments. Head and tentacles as in *Lepidonotus*. Elytra 5—15 pairs on the segments 2, 4, 5, 7,. .23, 26, 29, 32. Parapodia subbiramous or sesquiramous. Dorsal setae few, short. Ventral setae long, spinous. unidentate or bidentate. Pelagic and bathypelagic.

38. Nectochaeta grimaldii Marenzeller. (Fig. 25).

Nectochaeta grimaldii, Fauvel, 1923, p. 90, fig. 34, *a—i*: Monro, 1937, p. 261.

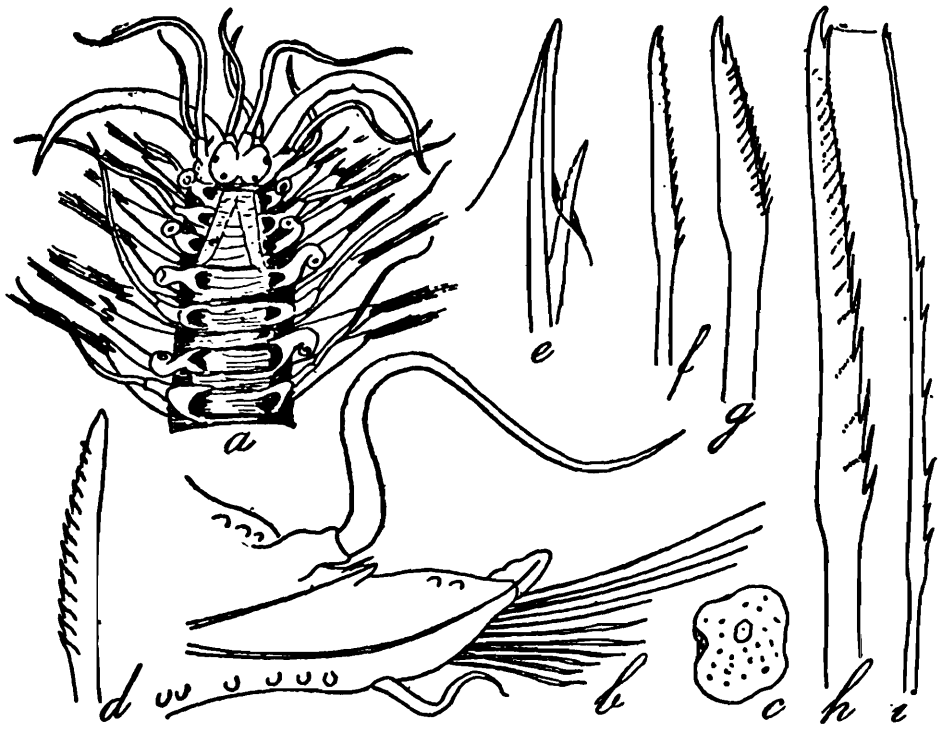


Fig. 25—*Nectochaeta grimaldii* Marenzeller: *a*, anterior region ×8; *b*, foot ×23; *c*, elytron ×23; *d*, tentacular seta ×233; *e*, aciculum and dorsal seta ×233; *f*, *g*, *h*, *i*, medium, inferior and upper ventral setae ×109, 233, 109.

Prostomium bilobed. 4 small black eyes. Tentacles, tentacular cirri and palps very long and slender. Dorsal cirri much longer than the feet. Dorsal ramus reduced to an aciculum and a small knob *with* 1 *or* 2 *very short dentate setae.* Ventral ramus long, with an anterior cirriform and posterior conical lips and dorsal and ventral rows of globular papillae. Upper ventral setae slender, spinous, capillary; the inferior ones enlarged, bidentate. Translucent, planktonic.

Length: 3—15 mm by 1—4 mm.

Remarks: Very likely a young stage of *Lepidasthenia*.

Occurrence: Central Arabian Sea.

Distribution: Arabian Sea; Mediterranean Sea; Atlantic Ocean.

Genus LEPIDASTHENIA Malmgren.

Body elongated, worm-like, segments numerous. Lateral tentacles inserted terminally, as in *Lepidonotus*. Elytra-bearing segments up to the end of the body. Elytra

minute leaving the greater part of the back naked. Dorsal ramus reduced to an aciculum and occasionally a few setae. Ventral setae bidentate.

Key to the species of Lepidasthenia.

Elytra rather large. Upper ventral setae slender	*maculata* Potts, p. 58.
Elytra very small. Ventral setae all alike equally stout	*microlepis* Potts, p. 57.

39. Lepidasthenia microlepis Potts. (Fig. 26, *e–f*)

Lepidasthenia microlepis, Potts, 1910, p. 343, pl. XIX, fig. 17, pl. XIX, fig. 52: Fauvel, 1930, p. 510.

Ventral setae large, yellow, all about the same size, the upper ones unidentate, the lower ones bidentate, at least in a variable number of segments. Dorsal setae

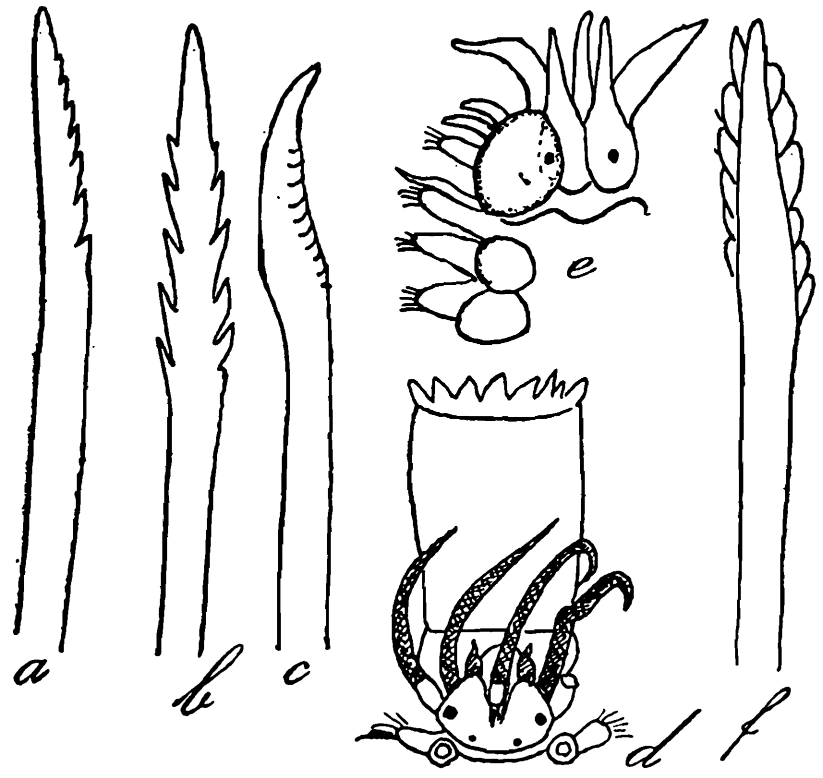


Fig. 26.—*Hololepidella commensalis*, Willey: *a, b, c*, dorsal, upper and inferior ventral setae; *d*, head and proboscis (after Willey), *Lepidasthenia microlepis* Potts: *e*, head and anterior segments; *f*, ventral seta of the 15th segment ×340 (after Potts).

absent. Elytra very small, hardly as broad as the elytrophore, with the exception of the first pair. They are marked by edging of brown or chocolate pigment. Dorsum yellowish or, sometimes, with dark segments alternating with paler ones, somewhat as in *L. elegans*. Dorsal cirri stumpy.

Length: 28–30 mm by 5 mm.

Occurrence: Andaman Islands, on coral stones; Hulule, Male Atoll, Maldive Archipelago.

Distribution: New Caledonia; Malay Archipelago; Andaman Islands; Maldive Archipelago; Durban.

40. **Lepidasthenia maculata** Potts. (Fig 27, *h–k*)

Lepidasthenia maculata, Potts, 1909, p. 344, pl. XX, fig. 33; pl. XXI, fig. 51: Fauvel, 1914b, p. 71; 1923a, p. 38, fig. 33, *l–k;* 1932, p. 29.

Upper setae of the ventral bundle more slender than the rest. Elytra relatively large, soft, destitute of fringe

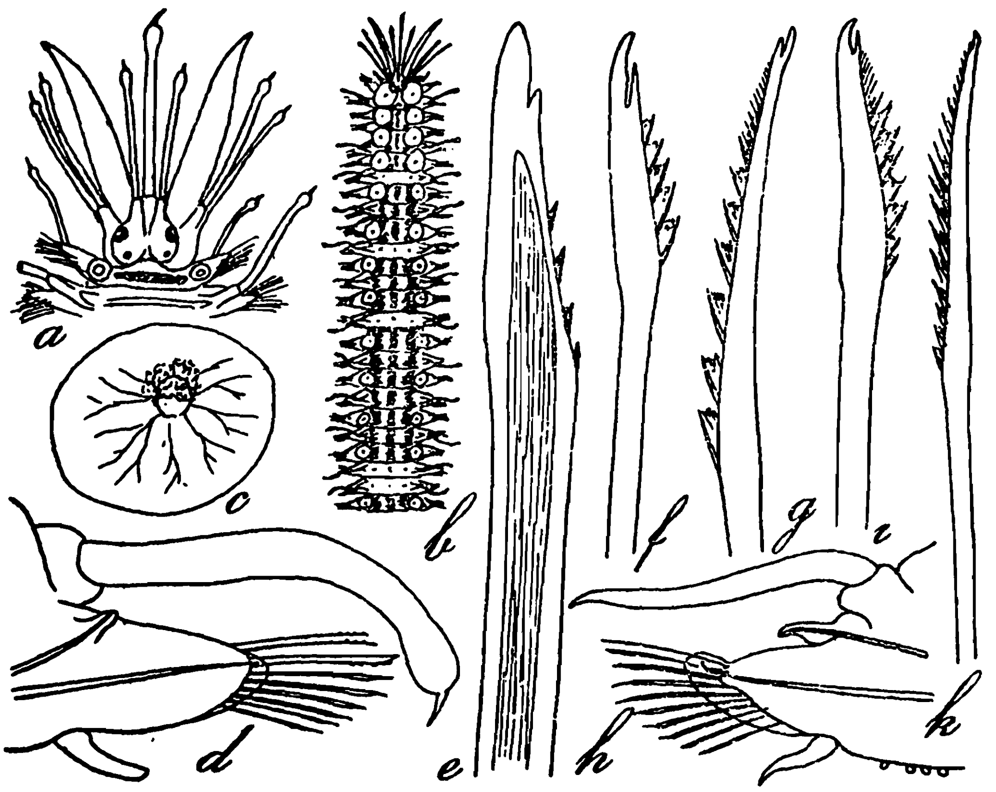


Fig. 27.—*Lepidasthenia elegans*, Grube: *a*, head; *b*, dorsal view, nat. size; *c*, elytron ×20; *d*, foot ×20; *e*, stout ventral bristle ×194; *f*, *g*, median and upper ventral setae ×187 (Red Sea). *L. maculata* Potts: *h*, foot ×23; *i*, *k*, median and upper ventral setae ×187.

and papillae, 31 pairs. Dorsal setae absent. The dorsum is provided with black pigment flecks.

var. **striata** Fauvel.

Fauvel, 1932, p. 29.

Tentacles slender, slightly unequal, a little enlarged under the tip. Nuchal fold conspicuous. Anterior pair of eyes large, the posterior pair smaller. The first dorsal

cirri are longer than the following ones. The rather large elytra leave about a third of the back naked and are rounded, soft, delicate, translucent, smooth, without either fringe or tubercles. Feet elongated, with two vertical, parallel, nearly equal, fillets. Dorsal cirri with big and short cirrophore, and cirrostyles slightly enlarged distally. In the median and posterior feet, the dorsal cirri are shorter, conical or fusiform. The dorsal ramus is reduced to a small knob with an enclosed aciculum. There are no giant setae in the ventral bundle. Two or three of the upper setae are more slender, with a long spiniferous area. The others are shorter and stouter, with transverse rows of spines and a bidentate apex.

Length: 25—36 mm.

Colour: In the anterior part of the body a white segment is followed by three marked with seven dark stripes; further on a colourless segment is followed by two with five stripes. Each elytra bears a large dark spot.

Occurrence: Mergui, enclosed in tubes of *Phyllochaetopterus.*

Distribution: of typical form Zanzibar; Morocco; Azores.

Genus HOLOLEPIDELLA Willey.

Antennae arising at a lower level than the unpaired tentacle; segments and elytra numerous. Posterior elytra irregularly inserted. Parapodia biramous.

41. Hololepidella commensalis Willey. (Figs. 26, *a—d*)

Hololepidella commensalis, Willey, 1905, p. 251, pl. I, figs. 17—20: Fauvel, 1932, p. 30.

Body elongated, fifty segments or more. Prostomium bilobed, with short frontal peaks. Anterior eyes lateral, posterior eyes dorsal. Median tentacle slender, inserted on a short and broad ceratophore. Lateral tentacles small, piriform, inserted ventrally as in *Harmothoë*. Nuchal fold not conspicuous. Dorsal cirri smooth, long, tapering; ventral cirri short. Elytra large, rounded, pale, delicate, translucent, overlapping and covering the back; they are destitute of either fringe or tubercles. There are at least 25-26 pairs, the last very irregularly alternating with the cirri. Dorsal tubercles conspicuous on the cirrigerous feet. Dorsal setae few, curved, smooth or partly serrate, much shorter than the ventral setae.

Superior ventral setae slender, serrated, unidentate; inferior short; median with a faint subterminal spur and normal fringes of spines.

Length: 8 mm. by 5 mm.

Colour: The back is brown and on the ventral side there are four longitudinal rows of brown spots. Elytra colourless.

Occurrence: Mergui; Ceylon.

Subfamily *SIGALIONINAE* Grube.

Body long and narrow, segments numerous. 4 sessile eyes. One or three tentacles. Two palps. Proboscis with a row of terminal papillae and four horny jaws. Elytra numerous, inserted on alternate segments: 2, 4, 5, 7, etc., and on each segment from the 23rd—29th up to the end of the body. Cirriform dorsal gills. Feet biramous. Dorsal setae simple, ventral setae simple or compound. Two anal cirri.

Key to the genera

1. Gills absent. Only one tentacle	*Pholoe* Johnston.
Cirriform gills. 2-3 tentacles	2
2. Only two lateral tentacles	*Sigalion* Audouin & M.-Edwards.
Three tentacles	3
3. Three very small subequal tentacles	*Eusigalion* Augener, p. 66.
Tentacles normal ..	4
4. Third setigerous segment with a dorsal cirrus ..	5
No dorsal cirrus on third setigerous segment	6
5. Median tentacle inserted on a ceratophore. Elytra coated with sand	*Psammolyce* Kinberg, p. 66.
Median and lateral tentacles inserted on the prostomium without ceratophore or ctenidia	*Euthalanessa* Darbour, p. 69.
6. Ventral setae falcigerous, with simple or jointed bidentate tip	*Sthenelais* Kinberg, p. 61.
Ventral setae spinigerous, with terminal piece pectinate-canaliculate ..	*Leanira* Kinberg, p. 69.

Genus STHENELAIS Kinberg.

A pair of ctenidia at the base of the median tentacle. Lateral tentacles fused with the first foot. Two long subulate palps, with ctenidia at the base. Scales covering the back, fringed. A branchial process on every foot from the fourth setigerous segment. Dorsal setae simple, capillary, tapering and spinous. Ventral setae compound, falcigerous and, sometimes, a few simple setae.

Key to the species of Sthenelais.

1. Spine-like simple setae generally absent in upper part of the neuropodium	*zeylanica* Willey, p. 62.
Spine-like simple setae in upper part of the neuropodium ..	2
2. Upper ventral setae only simple, spine-like . ..	*boa* Johnston, p. 61.
Upper ventral setae simple and compound	3
3. Elytra variable in ciliation ..	*variabilis* Potts, p. 62.
Elytra partly covered with calcareous concretions	*calcarea* Potts, p. 64.

42. Sthenelais boa Johnston. (Fig. 28, *a–k*)

Sthenelais boa, McIntosh, 1900, p. 408, pl. XXVI, figs. 7-8: Fauvel, 1923a, p. 110, fig. 41; 1932, p. 31.

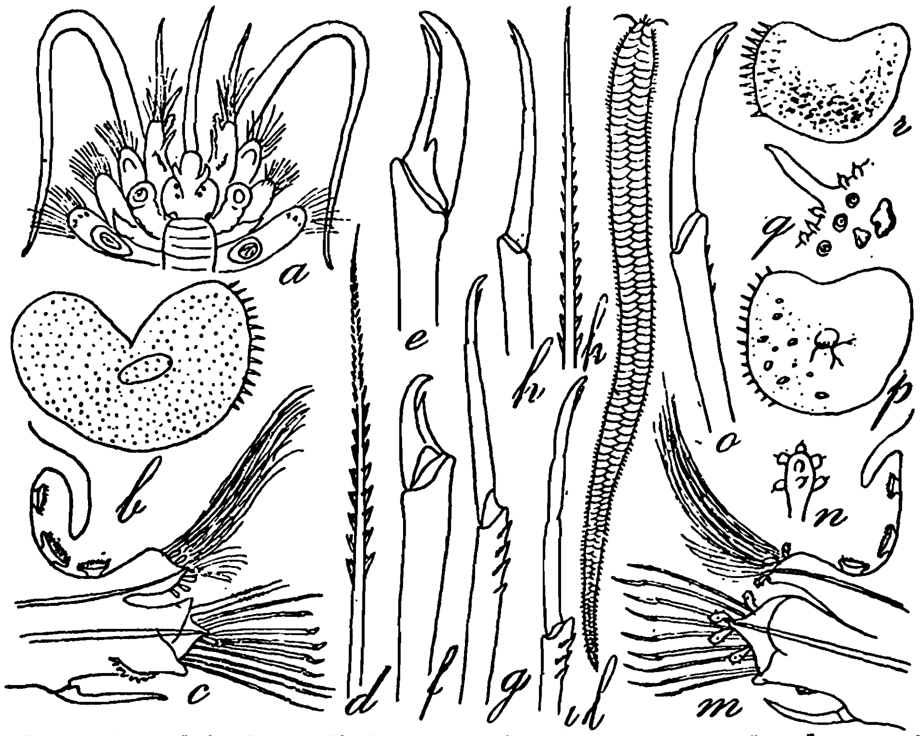


Fig. 28.—*Sthenelais boa* Kinberg: *a*, head, enlarged; *b*, elytron from mid-body ×8; *c*, foot ×23; *d*, upper simple ventral seta ×8; *e, f*, middle ventral falciger seta ×109; *g*, upper ventral seta with spinous shaft and articulate sickle-shaped end ×109; *h, i*, lower ventral setae ×140; *k*, dorsal seta; *l*, slightly reduced animal. *St. minor* Pruvot & Racovitza: *m, n, o, p, q*: *St. ctenolepis* Claparède; *r*, elytron.

Sthenelats idunae Sars, Saint Joseph, 1888, p. 187, pl. VIII, fig. 55.

Sthenelais orientalis Potts, 1910, p. 348, pl. 21, fig. 62.

Scales mostly reniform, crossing and overlapping over the back, with numerous minute papillae and a fringe on the outer border. Ventral ramus of the feet with 2—3 simple bipectinate setae. Compound setae with a short sickle-shaped appendix and a smooth shaft, others with a pluri-articulate appendix and, on the anterior feet, a few compound setae with a spinulose shaft. Three cup-shaped ctenidia above the dorsal division of the foot. Ventral division with stylodes and three bracts and a papillose ciliated frill. Ventral cirrus subulate.

Length: 100—200 mm.

Colour: Very variable, grey, yellow, brown, red.

Occurrence: Ceylon, Galle; Cape Comorin; Krusadai; Amiranti.

Distribution: Indian Ocean; Mediterranean Sea; Atlantic Ocean.

43. Sthenelais zeylanica Willey. (Fig. 29, *a*).

Sthenelais zeylanica, Willey, 1905, p. 258, pl. II, fig. 48: Fauvel, 1927b, p. 416; 1932, p. 32.

Differs from *Sth. boa* in its ventral cirrus with two long tapering stylodes giving it a trifurcate appearance, in the absence of the parapodial frilled collars and in the compound bristles with fewer joints and shorter sickle-shaped tips. Simple bipectinate setae in the upper part of the ventral ramus are not always entirely absent, sometimes one may be found on a few posterior feet.

Length: 100—200 mm. by 5 mm.

Colour: Elytra dotted with small red-brown specks.

Occurrence: Trincomalee; Kilakarai.

Distribution: India.

44. Sthenelais variabilis Potts. (Fig. 29, *b—d*).

Sthenelais variabilis Potts, 1910, p. 349, pl. XIX, figs. 22-23, pl. XXI, fig. 68.

" Head with two pairs of eyes, both anteriorly placed, foremost and smaller quite lateral. Palps very long and slender, contrasting with shorter structures in *Sth. orientalis* (=*Sth. boa*). Head closely surrounded by succeeding segments, the first three having revolved almost at right angles. Elytra close, overlapping, uniform in shape,

except the first which is oval, and of a thin translucent nature. Only in one specimen from the Maldives (Hululu, Male, 25 fms) were any markings preserved on their surface; in this example a spot of white pigment over the elytrophore, and further inward a brown crescent surrounding a white spot. Male specimens, first elytron beset with a large, thick anterior margin. In succeeding elytra, margin ciliate, but degree of ciliation differing greatly in various forms. In some, cilia on greater part of border, and even developed on surface (var. *hirsuta*); in others, outer border only ciliate, and tubercles confined to small area of surface (var. *glabra*) Ventral setae in

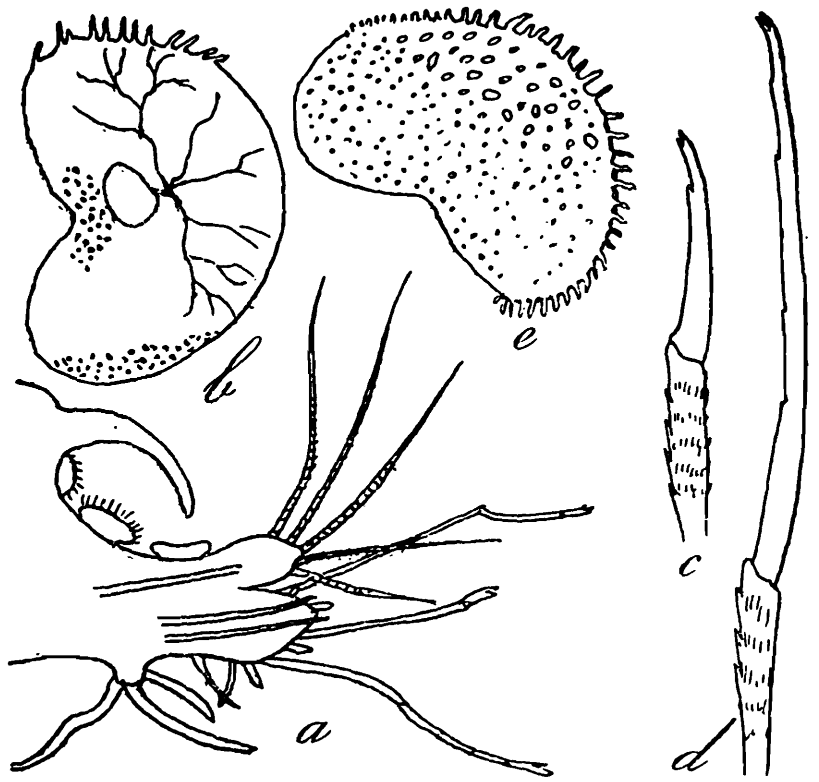


Fig. 29.—*Sthenelais zeylanica* Willey: *a*, foot (after Willey). *St. variabilis* Potts, var. *glabra*: *b*, posterior elytron, *c, d*, spinous ventral setae of the 15th segment ×140, *Sth. calcarea* Potts, *e*, elytron (after Potts).

following succession: (1) Spinose simple setae; (2) slender type of compound setae, with long jointed appendix and spinose shaft; (3) stronger setae with smooth shaft and short appendix; (4) slender setae with smooth shaft and long jointed appendix. In first few segments all setae elongated, with long jointed appendices and setae of type (2) absent." (Potts)

Length: 28—37 mm. by 3.5—4 mm.

Occurrence: var. *hirsuta*: Hululu, Male Atoll, Maldives. var. *glabra*: idem.

Distribution: Maldive Archipelago; Zanzibar.

45. **Sthenelais calcarea** Potts. (Fig. 29, *e*).

Sthenelais calcarea, Potts, 1910, p. 349, pl. XIX, fig. 24.

"Head provided with two pairs of eyes, both very small, anterior placed underneath on anterior border. Ctenidia at sides of tentacle small. Elytra, save for the first which is oval, reniform, provided with cilia, which are moderately long on the outer border, very short on the posterior edge, alternation of shorter and longer taking place in a curiously irregular way. The surface covered with small equal tubercles, flat topped, with chitinous rims thickened on one side. In anterior region of elytron calcareous concretions cover surface; grains of all sizes occurring in connection with tubercles already mentioned, their curious granular nature indicating that they are true concretions. First elytron alone not possessing grains, though the tubercles more thickly placed there than in any other of the series. Parapodia rather resembling those in *Sth. variabilis* in character. Upper division of ventral setae comprising spinose individuals both simple and compound." (Potts)

Length: more than 57 mm. by 3.5 mm.

Remarks: The encrusting particles are not foreign, but appear to be formed *in situ*.

Occurrence: Goidu, Goifurfehendu Atoll, Maldive Archipelago.

Genus EUTHALENESSA Darboux.

Median tentacle inserted between the prostomial lobes without ceratophore or ctenidia. Lateral tentacles inserted on the frontal margin. A dorsal cirrus on the third setigerous segment. A branchial process on every foot from the fourth setigerous segment. Elytra overlapping but leaving the middle of the back uncovered; they are fringed with multifid papillae. Dorsal setae spinous, simple. Ventral setae compound, falcigerous.

46. **Euthalenessa djiboutiensis** (Gravier) (Fig. 30, *a*, *b*)

Thalenessa djiboutiensis, Gravier, 1901, p. 231, pl. VII, figs. 114–117.

Euthalenessa djiboutiensis, Fauvel, 1918, p. 331; 1919, p. 345; 1922, p. 492; 1932, p. 32.

Three small conical tentacles all alike. Anterior pair of eyes large, posterior pair small. Dorsal cirrus on the third setigerous segment, with a large ceratophore and

a small tapering ceratostyle. Elytra reniform, with long digitiform multifid papillae on the outer margin. Three ctenidia on the dorsal division of the feet; numerous digitiform stylodes on the anterior feet, and foliaceous parapodial bracts on the others. A dorsal tuft of

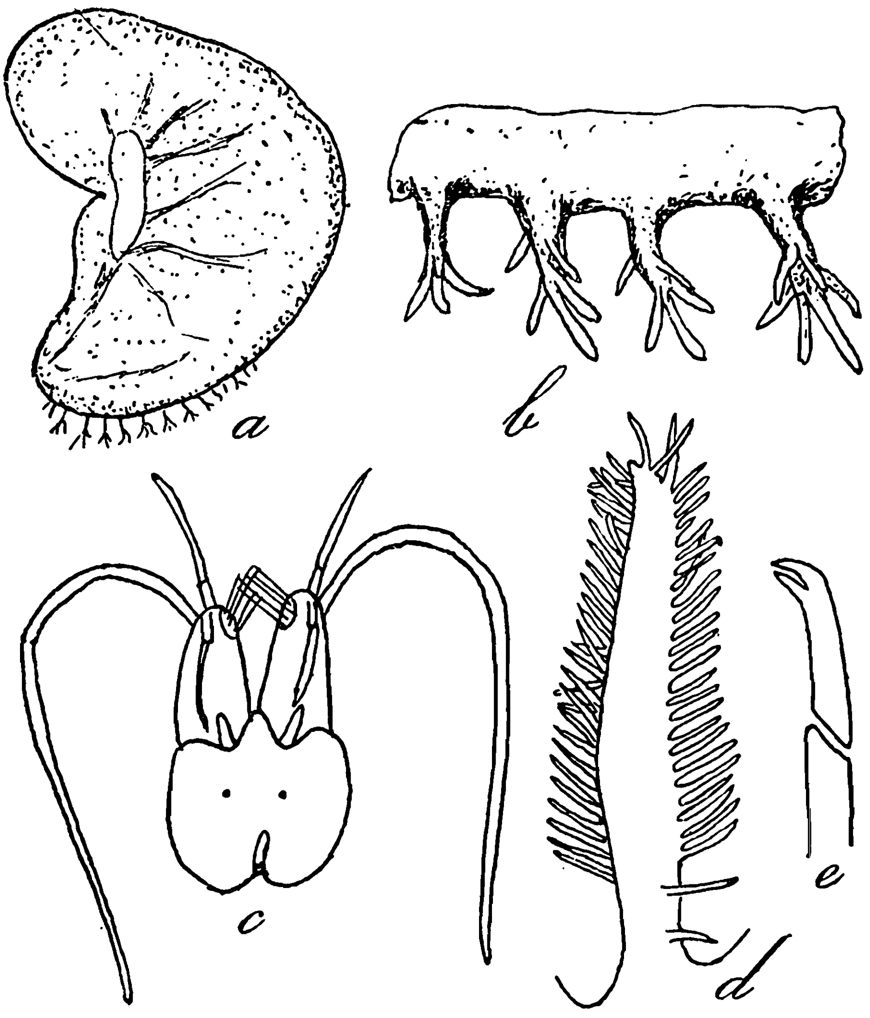


Fig. 30.—*Euthalenessa djiboutiensis* (Gravier): *a*, elytron; *b*, elytron's papillae, enlarged (after Gravier). *Eusigalion stylolepis* (Willey): *c*, head; *d*, elytron's marginal fimbriae; *e*, compound seta of the 60th segment (after Willey).

slender simple setae. Ventral setae compound, with a bidentate end-piece, simple or multi-articulate.

Length: About 150 mm. by 7–8 mm.

Colour: In life pale yellow, marked with pigment spots. In spirit, elytra with rusty spots.

Occurrence: Ceylon; off Puri, Orissa, Madras Coast; Mergui; Pedro Shoal.

Distribution: Australia; Mergui; India; Persian Gulf; Red Sea.

Incertae sedis.

Thalenessa digitata McIntosh, is an *Euthalenessa;* very close to *E. djiboutiensis* (Gravier), but the descriptions of Willey and Potts are too scanty to enable one to ascribe the specimens from Ceylon and the Maldives either to *E. digitata* or to *E. djiboutiensis.*

Genus EUSIGALION Augener.

Prostomium subtrapezoidal, with three subequal tentacles, a pair inserted near the anterior margin and a *median tentacle posterior to, or between the eyes.* Four minute eyes dispersed in a rectangle on the dorsal side of the prostomium. Elytra pedunculate, like those in *Sigalion,* with plumose fimbriae. Cirriform branchiae under the elytra: *they are wanting on the intervening segments.*

47 **Eusigalion stylolepis** (Willey) (Fig. 30, *c—e*)

Thalenessa stylolepis, Willey, 1905, p. 261, pl. III, figs. 43—56.

Prostomium large, flattened, shield-shaped, with three notches, two on the frontal border from which the paired antennae arise; one on the occipital border from which the *tentaculum impar* arises. Two eyes, two pairs of tentacular cirri with setae and two long smooth filiform palps. *Elytra pedunculate.* Cirriform branchiae under the elytra; *absent on intervening segments* which have only a small tubercle. No dorsal cirri. The elytra carry 12—13 plumose fimbriae on the outer border and a small ctenidium on the inner side of each elytrophore. Two dorsal ctenidia on each foot. Dorsal setae long, simple, fringed. Ventral superior bundle of simple whorled setae. All the remaining ventral setae compound falcigerous with very long, many jointed, tapering bidentate appendices. In the posterior feet, two stout setae with short sickle.

Length: 35 mm. by 3 mm.

Occurrence: Modragam Paar, Ceylon, out of coral block.

Genus PSAMMOLYCE Kinberg.

Body narrow and long, segments very numerous. Median tentacle inserted on the anterior margin of the prostomium, without ctenidia. Lateral tentacles fused with the first foot. A dorsal cirrus on the third setiger-

ous segment. A branchial cirriform process on every foot. Elytra and back with adhesive papillae, densely coated with sand grains. Dorsal setae simple, slender. Ventral setae compound, falcigerous.

Key to the species of Psammolyce.

1. Elytra without any large club-like lobe	*fijiensis* McIntosh, p. 67.
Elytra with club-like lobes	2
2. Elytra with two club-like lobes	*zeylanica* Willey, p. 68.
Elytra with one club-like lobe	*antipoda* Schmarda, p. 67.

48. Psammolyce fijiensis McIntosh.

Psammolyce fijiensis, McIntosh, 1885, p. 148, pl. XXI, fig. 6, pl. XXII, fig. 4, pl. XXIV, fig. 6, pl. XIIIA, fig. 28: Fauvel, 1932, p. 33.

First pair of elytra very large, prow-shaped, the others elongate oval, with anterior margin concave and slightly bilobed, but without any large club-like process, and anterior border beset with long adhesive papillae. Dorsal cirrus of the third setigerous segment small and conical and tentacular cirri not swollen at the tip. A transparent collar above the foot. Dorsal setae plentiful, long, slender and serrated. Ventral setae large, straight, all compound, differing very little from one another, with shaft more or less spinous, a terminal piece more or less elongate and always conspicuously bidentate. Ventral cirrus filiform. Ventral papillae filiform, velvety. Deeply incrusted with sand grains.

Occurrence: Mergui Archipelago; 40 fms.

Distribution: Fiji Islands; Mergui Archipelago.

49. Psammolyce antipoda (Schmarda). (Fig. 31, *a—h*).

Pelogenia antipoda, Schmarda, 1861, p. 160, pl. XXXVII, figs. 320—322.

Psammolyce antipoda, Ehlers, 1904, p. 13: Augener, 1913, p. 96; Fauvel, 1917, p. 186, pl. IV, figs. 12-13.

Psammolyce rigida, Grube, 1878, p. 55 (*pro parte*): Willey, 1905, p. 256, pl. II, figs. 44—47.

Elytra more or less rounded with anterior margin straight, or slightly concave, and *a single club-like process,* and posterior border beset with long adhesive papillae. Dorsal cirrus of the third setigerous segment rather long and bi-articulate and tentacular cirri not swollen at the tip. A semi-circular collar above the foot. Dorsal

setae slender, serrated. Ventral setae large, yellow, all compound, differing from one another; the upper ones with a spinose shaft, the upper and median with a short unidentate or bidentate terminal piece; the inferior ones with a long slender one. Ventral cirrus slightly enlarged below the tip. Filiform and rounded ventral papillae mixed.

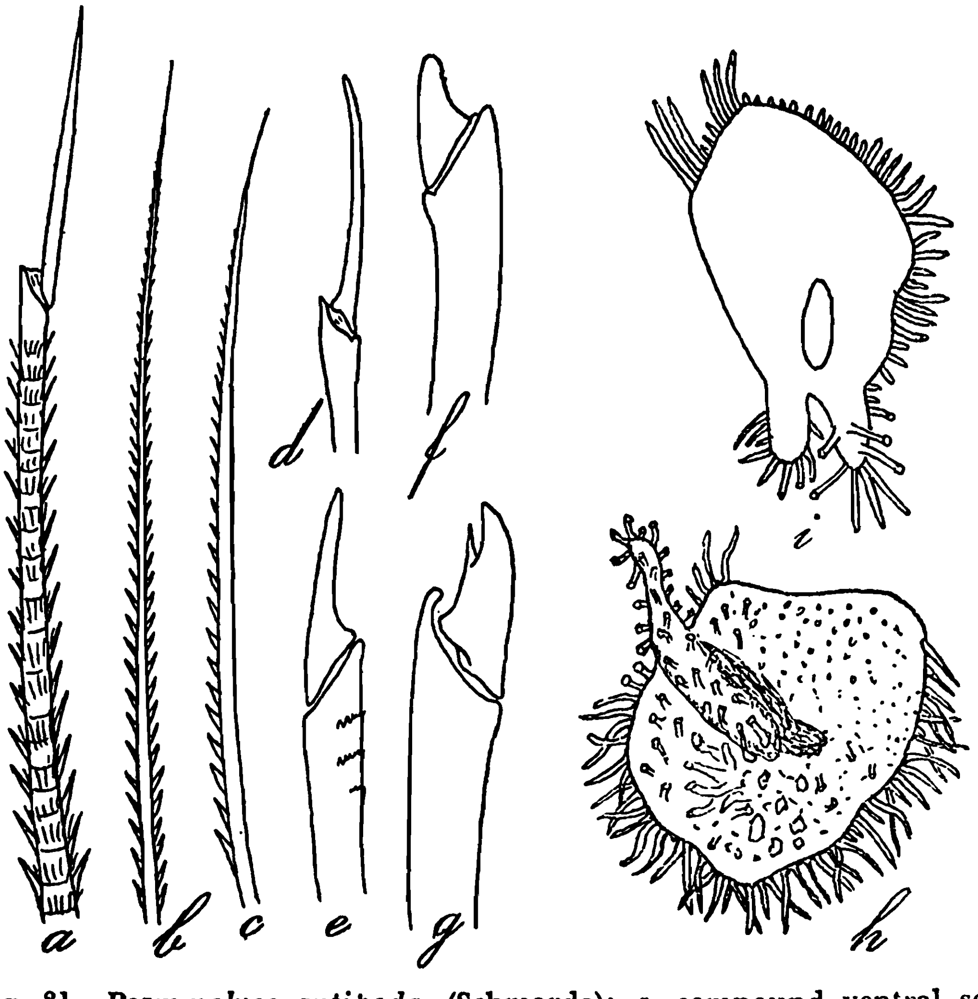


Fig. 31.—*Psammolyce antipoda* (Schmarda): *a*, compound ventral seta of the 2nd segment ×150; *b, c*, dorsal bristle from middle of body, front and side view ×150; *d*, superior ventral compound seta ×80; *e, f, g*, two median ventral setae from the same foot, one unidentate, the other bidentate ×80; *h*, elytron ×15. *Ps. zeylanica* Willey, *i*, elytron (after Willey).

Length: 95 mm. by 9 mm.

Occurrence: Ceylon, 10 miles off West Cheval Paar.

Distribution: Australia; New Zealand; Philippine Islands; Ceylon.

50. **Psammolyce zeylanica** Willey. (Fig. 31, *i*)

***Psammolyce zeylanica*, Willey, 1905, p. 255, pl. I, II, figs. 33–43.**
***Psammolyce rigida*, Grube, 1868, p. 631, pl. VII, fig. 1 (*pro parte*).**

Elytra triangular, with a straight anterior margin and *two large club-like processes* and a posterior border beset with long adhesive papillae. Dorsal cirrus of the third segment with terminal portion more slender and shorter than its peduncle; tentacular cirri shorter and not swollen. Dorsal setae capillary, finely plumose. Ventral compound setae with sub-elongate appendices, then a central group of stout setae with short appendices and an inferior group of slender setae with elongate appendices. Acuminate and globular papillae are mixed on the ventral surface, which is hairy.

Occurrence: Ceylon.

Distribution: Red Sea (?) ; Ceylon.

Remarks: This species is very likely a variety of *Ps. antipoda* (Schmarda) Under the name of *Ps. rigida* Grube has described two different forms of *Psammolyce.*

Genus LEANIRA Kinberg.

Body narrow and long, segments very numerous. Median tentacle with a ceratophore and ctenidia. Lateral tentacles fused with the first foot. No dorsal cirrus on the third setigerous segment. A branchial cirriform process on every foot, from the fourth backwards. Elytra smooth or fringed. Dorsal setae simple, slender, serrated. Ventral setae compound, spinigerous, and, sometimes, a few simple bristles.

51. **Leanira japonica** McIntosh. (Fig. 33, *a, b*)

Leanira japonica, McIntosh, 1885, p. 154, pl. XXII, fig. 8, pl. XIVA, figs. 1—2; Fauvel, 1932, p. 33.

Leanira sibogae, Horst, 1917, p. 115, pl. XXIV, figs. 1—3.

Sthenolepis japonica, Izuka, 1912, p. 88, pl. X, figs. 3—7; Willey, 1905, p. 259, pl. II, fig. 49.

Prostomium with four black eyes and antennal ctenidia. On the third setigerous segment a small conical tubercle, but no true cirrus. Elytra smooth, unfringed, overlapping, leaving the mid-dorsum exposed. Dorsal setae numerous, long, slender and transversely fringed. Ventral setae compound, spinigerous, with a long, sharp pectinate-canaliculate terminal piece, and, occasionally, one or a few superior simple bristles provided with whorls of spikes.

Length: 30—50 mm. by 2 mm.

Occurrence: Mergui; Andaman Islands; Bay of Bengal; Ceylon; Arabian Sea; Gulf of Oman.

A deep sea inhabitant, sometimes in shallow waters (Galle, in 7 fms.).

Distribution: Japan; Annam; Malay Seas; Indian Ocean.

Subfamily *ACOETINAE* Grube.

Body elongate. Prostomium bilobed, with two large ommatophores (stalked eyes), or four sessile eyes. Three tentacles, the medium sometimes reduced to a small tubercle. Two long palps. Proboscis with papillae on the margin; median dorsal and ventral ones are tentaculiform. Elytra on segments 2, 4, 5, 7, 9 and on every alternate succeeding segment. Feet biramous. Bristles simple. A spinning gland in the dorsal division of the feet.

Key to the genera.

1. With two tentacles	*Eupolyodontes* Buchanan.
With three tentacles	2
2. Eyes sessile	*Eupanthalis* McIntosh, p. 75.
Two eyes borne on ommatophores	3
3. With branchiae. True *bipennato-penicillate* setae absent	*Polyodontes* Renier, p. 70.
No branchiae. *Bipennato-penicillate* setae present	*Panthalis* Kinberg, p. 74.

Genus POLYODONTES Renier.

Segments very numerous. Two large ommatophores (eye-stalks) and two small posterior sessile eyes. A median tentacle. Lateral tentacles inserted beneath the ommatophores. Two long palps. Four horny jaws. Proboscis bilobed. Two pairs of tentacular cirri with basal setae. Spinning glands in the feet. Branchial tubercles present on the feet. First foot little or not at all modified. Elytra leaving the back uncovered. Feet biramous; dorsal ramus small, with capillary setae. Ventral ramus large, thick, with three kinds of setae: (1) serrulate, (2) aristate, (3) *serrulate subspiral;* genuine *bipennato-penicillate* setae absent.

Key to the species of Polyodontes.

Without dorsal tubercles. No penicillate setae. First foot short	*maxillosus* Ranzani, p. 71.
Dorsal tubercles present. Pseudo-penicillate setae. First foot elongated	*melanonotus* Grube, p. 72.

52. **Polyodontes maxillosus** Ranzani. (Fig. 32)

Polyodontes maxillosus, Fauvel, 1923a, p. 97, fig. 37; 1932, p. 35.
Panthalis lacazii, Pruvot and Racovitza, 1895, p. 441, pl. XIX, figs. 84—104.
Polyodontes oculea, Monro, 1928, p. 572, figs. 27—30.
?*Panthalis bicolor,* Grube, (*partim*) 1878, p. 517.
?*Eupompe australiensis,* McIntosh, 1885, p. 135.
?*Eupompe indica,* Beddard, 1887, p. 256, pl. XXI, figs. 1, 3.
?*Polyodontes oculea,* Treadwell, 1902, p. 188, figs. 14—18.

Body reaching a very large size. Stout dark ommatophores ending in pale lenses. Median tentacle about the same length as the ommatophore. Lateral tentacles

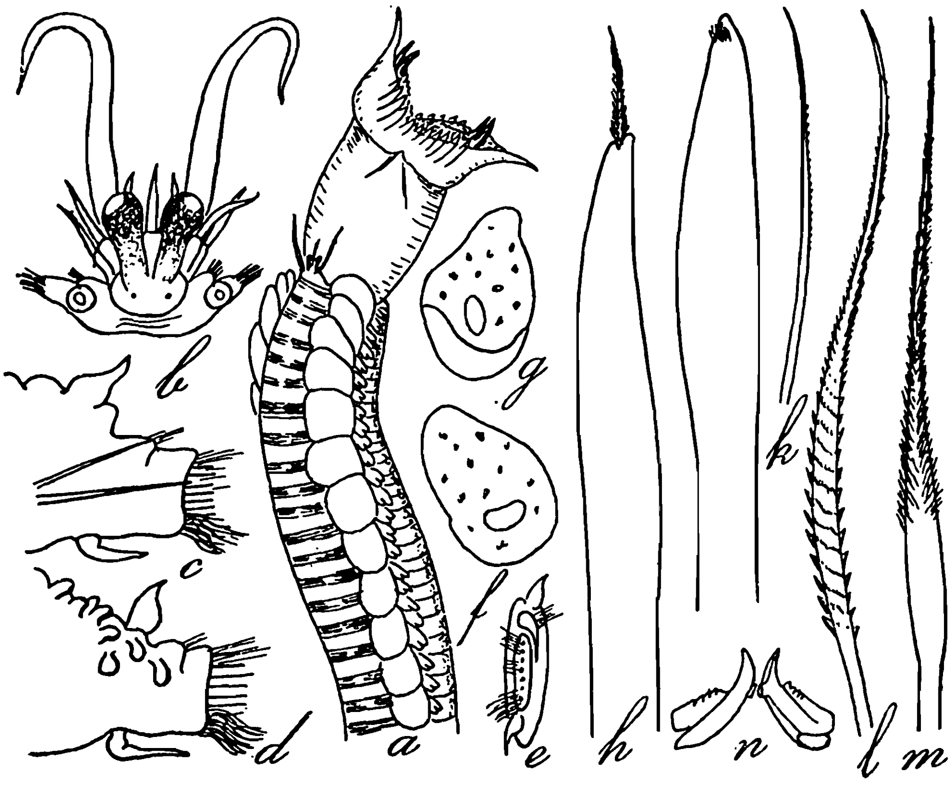


Fig. 32.—*Polyodontes maxillosus* Ranzani: *a,* anterior end, slightly reduced (after R. Saint-Loup); *b,* head, enlarged; *c,* anterior foot ×2; *d,* branchiate foot ×2; *e,* foot, front view ×2; *f, g,* anterior and folded elytron ×2; *h, i,* aristate setae ×100; *k,* dorsal seta ×80; *l,* inferior seta (*serrulate subspiral*) ×80; *m,* superior ventral seta ×80; *n,* inferior jaw (after Pruvot and Racovitza).

short, filiform. Tentacles and cirri smooth. Proboscis flattened dorso-ventrally, each lip provided with a long median cirriform papilla and 8—10 short ones. Bases of the fangs denticulate. Facial tubercle absent. First elytra large, rounded, smooth, without fringe; the others with posterior margin often folded, pocket-like. Anterior elytra overlapping in front. Branchial tubercles on the feet, but no dorsal processes. Spinning glands from the 8th foot backwards, and a flattened dorsal ramus with a few spinulose capillary setae; posteriorly the ramus is reduced to a short conical lobe. Ventral ramus large, thick, with two vertical lips enclosing: (1) a bundle of slender setae enlarged above, the shaft finely serrated, (2) a vertical row of large, yellow, aristate setae, blunt, or bearing a long hairy process, and a bundle of *serrulate-subspiral* setae. A felt tube.

Length: Up to 1 metre by 20—25 mm.

Colour: In life, body yellowish with transverse brown or purple streaks. Elytra pale brown or edged with dark violet and more or less pale dots.

Remarks: Sometimes caught on fish hooks.

Occurrence: Andaman Sea, 53 fms; Mergui.

Distribution: Australia (?); Indian Ocean; Red Sea (?); Mediteranean; Atlantic Ocean.

53. **Polyodontes melanonotus (Grube).** (Fig. 33, *c—g*)

Polyodontes melanonotus, Buchanan, 1894, p. 441; Fauvel, 1914, p. 472; 1932, p. 37.

Panthalis melanonotus, Grube, 1878, p. 48; pl. IV, fig. 1; Willey, 1905, p. 254, pl. I, figs. 21—27.

Polyodontes sibogae, Horst, 1917, p. 131, pl. XXVIII, figs. 4—10.

Acoetes magnifica, Treadwell, 1929a, pp. 1—4, figs. 1—7.

Ommatophores large, with black subspherical eyes on the extremity of clavate peduncles. Two small eye-spots on each side of the prostomium. Tentacles and palps with pigment spots. First pair of elytra large, crossing and overlapping in front, flat, smooth, without fringe or pouch: others with a narrow posterior pouch. First foot slightly modified, elongated and pointing forwards. Bladder-like branchial tubercles on a number of feet. A dorsal geniculate, or sub-cylindrical, process above the base of the dorsal cirrus. Spinning glands from the 8th foot backwards. Dorsal ramus flattened, with a few capillary setae. Ventral ramus large, thick, with

four kinds of setae: (1) a bundle of slender setae enlarged above the shaft and serrulate, (2) pseudo-penicillate setae, (3) a vertical row of large yellow aristate setae, and (4) a bundle of *serrulate-subspiral* setae.

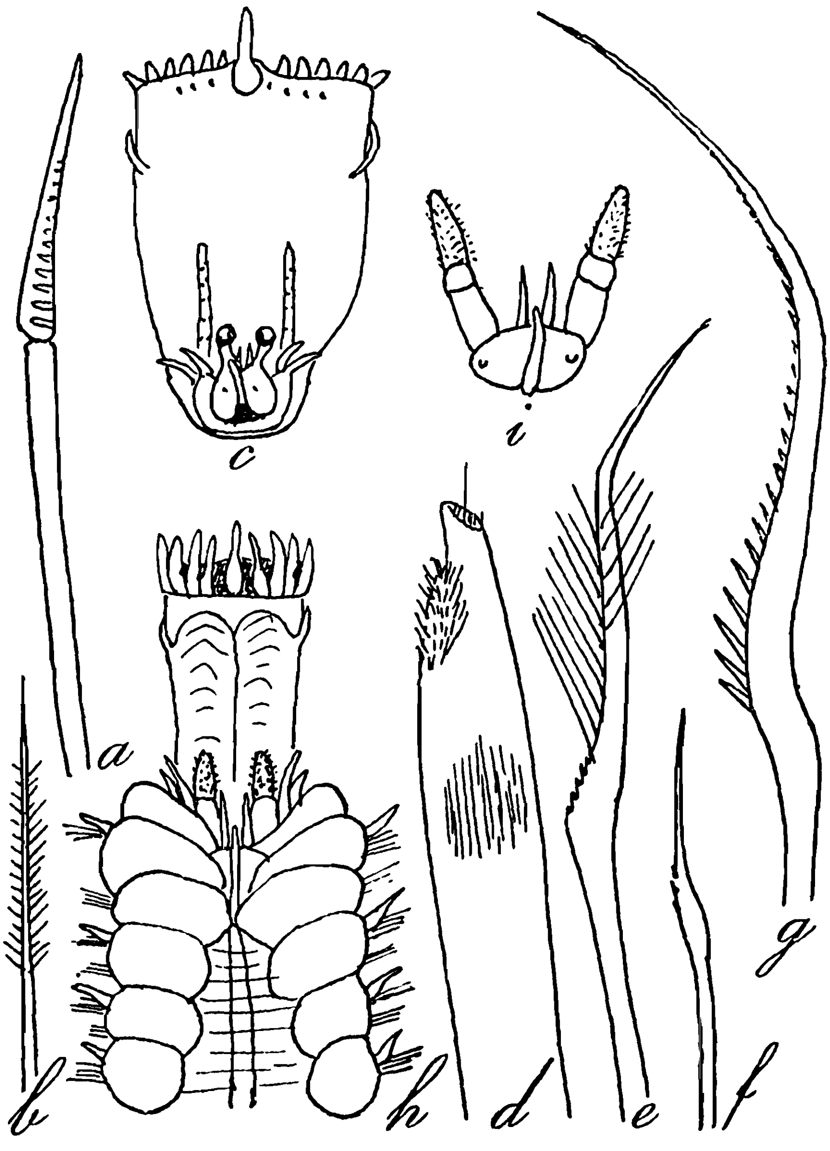


Fig. 33.—*Leanira japonica* McIntosh: *a*, camerated seta; *b*, bipectinate seta. *Polyodontes melanonotus* Ranzani: *c*, head and proboscis; *d*, aristate seta; *e*, penicillate seta; *f*, superior ventral seta; *g*, inferior ventral seta (after Willey). *Eupanthalis edriophthalma* Potts: *h*, anterior end; *i*, head (after Willey).

Length: Breadth, about 6 mm. (incomplete specimens).

Occurrence: Andaman Islands; Burma, off Tenasserim, and Arakan Coast; Ceylon; Gulf of Oman, 230 fms.

Distribution: Philippine Islands; Malay Archipelago; Indian Ocean; Ceylon; Madagascar; Jamaica.

Genus PANTHALIS Kinberg.

Body elongated. Two large ommatophores (eye-stalks). A median tentacle. Lateral tentacles inserted beneath the ommatophores. Two long palps. Four horny jaws. Proboscis bilobed. Two pairs of tentacular cirri. Spinning glands in the feet. *Branchial tubercles absent. First foot modified.* Elytra flat, or with a posterior pouch. Feet biramous; dorsal ramus small, with capillary setae; ventral ramus with setae of several types: (1) serrulate; (2) *bipennato-penicillate,* (3) aristate, (4) *serrulate-subspiral.* A felt-like tube.

54. **Panthalis oerstedi** Kinberg. (Fig. 34, *a—h*).

Panthalis oerstedi Kinberg, 1857, p. 25, pl. VI, fig. 34: Watson, 1895, p. 169, pls. IX—X: Fauvel, 1914b, p. 78; 1932, p. 39; 1923, p. 98, fig. 38, *a—h*.

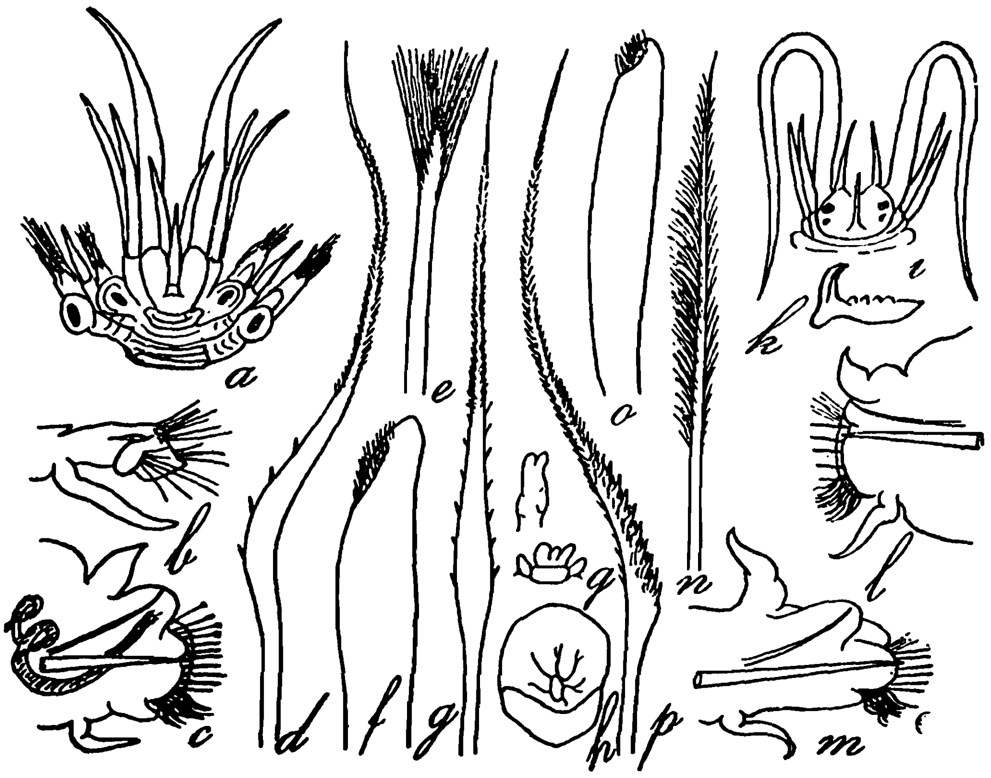


Fig. 34.—*Panthalis oerstedi* Kinberg: *a,* head, enlarged (after McIntosh); *b,* first foot (after Pruvot and Racovitza); *c,* foot ×5; *d,* inferior ventral seta (*serrulate-subspiral*) ×109; *e,* superior ventral penicillate seta ×109; *f,* aristate seta ×80; *g,* inferior ventral seta ×109; *h,* elytron ×4. *Eupanthalis kinbergi* McIntosh: *i,* head, enlarged; *k,* jaw; *l, m,* middle and posterior feet ×5; *n,* penicillate seta ×109; *o,* aristate seta ×109; *p,* inferior ventral sigmoid seta ×109; *q,* upper and lower proboscis' papillae, enlarged. (This species is very like *E. edriophthalma* Potts, if not conspecific).

Panthalis marenzelleri, Pruvot and Racovitza, 1895, p. 442, pl. XIX, fig. 105; pl. XX, figs. 106—110.

Panthalis jogasimae, Izuka, 1912, p. 68, pl. I, fig. 6; pl. VIII, figs. 1—6: Monro, 1928, p. 568.

Size comparatively small. About 80 segments. Two large oval, or cylindrical, colourless ommatophores. Tentacles subulate. Two long tapering palps. Tentacles and cirri smooth. Proboscis with the median papilla elongated. Bases of the fangs denticulate. Facial tubercle absent. First elytra large, rounded, smooth, without fringe, overlapping in front; the others with posterior margin folded pocket-like. Branchial tubercles and dorsal processes absent. First foot modified, elongated, pointing forwards, with a heart-shaped foliaceous ventral ramus. Spinning glands from the 8th foot backwards. Dorsal ramus flattened, achaetous; ventral ramus compressed. Ventral setae of three kinds: (1) *bipennato-penicillate,* (2) a vertical row of aristate bristles, and (3) a bundle of *serrulate-subspiral* setae. In the anterior segments, preceding the spinning glands, setae similar to the lower ones take the place of the brush-shaped setae. A felt-like tube secreted by the spinning glands and coated with mud is always present.

Length: 40—100 mm. by 8—10 mm.

Colour in life: Back pearly-white anteriorly, flesh coloured posteriorly. Elytra uncoloured, translucent.

Remarks: From deep dredgings on muddy or sandy bottom: 34—810 fms.

Occurrence: Off Burma; Andaman Islands; Bay of Bengal; Laccadive Sea;; Arabian Sea.

Distribution: Pacific Ocean, Japan; Indian Ocean; Mediterranean Sea; Atlantic Ocean.

Genus EUPANTHALIS McIntosh.

Body narrow, size moderate. Four *sessile eyes,* no ommatophores. A median tentacle. Lateral tentacles inserted at the end of the prostomial lobes. Two palps. Proboscis bilobed. Median dorsal and ventral papillae somewhat larger and lobed. Two pairs of tentacular cirri. Spinning glands in the feet. Branchial tubercles absent. Elytra flat. Feet biramous. Dorsal ramus achaetous (first feet excepted) ; ventral ramus thick, with three kinds of setae: (1) serrulate; (2) aristate; (3) *serrulate-subspiral.* A felt-like tube.

55. **Eupanthalis edriophthalma** (Potts). (Fig. 33, *h, i*).

Panthalis edriophthalma, Potts, 1910, p. 345, pl. XIX, fig. 19; pl. XXI, figs. 56-57: Fauvel, 1932, p. 41.

Panthalis nigromaculata (*non* Grube), Willey, 1905, p. 255, pl. I, figs. 28—32.

Head spherical, divided by a median longitudinal line. Eyes, two pairs, sessile, anterior pair rather larger, both distinct, pigment masses situated on lateral border. Median tentacle slender, filiform. Lateral tentacles filiform, longer than the median. Palps stout, rather long, ending abruptly in acute tip. Elytra translucent. The anterior ones larger and overlapping forwards, whilst the others overlap backwards and show a slight posterior flap. Ventral setae of four kinds: (1) slender gibbous setae with close-set spines placed irregularly; (2) similar setae with spines arranged in whorls, occurring after the eleventh segment; (3) aristate setae with long appendix; (4) slender gibbous setae differing slightly from (1)

Length: 26 mm. by 3 mm.

Elytra colourless.

Occurrence: Burma, off Akyab; Ceylon, North of Negombo, 9 fms.

Distribution: Indian Ocean, Ceylon, Akyab.

Family PISIONIDAE Levinsen.

Prostomium without tentacles, fused with the buccal segment, the two pairs of cirri of which are directed forwards. Proboscis with four jaws. Feet uniramous. Dorsal and ventral cirri globular. Two anal cirri. Simple setae and compound falciform setae.

Genus PISIONE Grube.

Body vermiform, segments numerous. Prostomium reduced, with eyes. Buccal segment with a pair of stout denticulate acicula, dorsal and ventral unequal cirri directed forwards: the dorsal ones looking like tentacles and the ventral ones, stouter and longer, mimicking palps. Dorsal and ventral cirri globular. Feet long, with two lobes and two spines. Upper setae simple, lower ones compound, falciform.

56. *Pisione oerstedi* Grube. (Fig. 35)

Pisione oerstedi, Grube, 1857, p. 175: Levinsen, 1886, p. 292: Ehlers, 1900, p. 257; 1901b, p. 61, pl. VI, figs. 1—9: Augener, 1926, p. 445: Fauvel, 1939, p. 267, fig. 2.

Pisione contracta, Ehlers, 1901, p. 64, pl. VI, figs. 10—18.

Prostomium trapeziform, with four small eyes. Proboscis crowned with short papillae, armed with two dorsal and two ventral hooks (as in *Polynoë*) Dorsal tentacle-like cirri of the buccal segment short and slender, with a basal globular papilla. Ventral cirri much longer, mimicking palps. Two large acicular spines, swollen in the middle and expanded at the tip, which is bevelled and

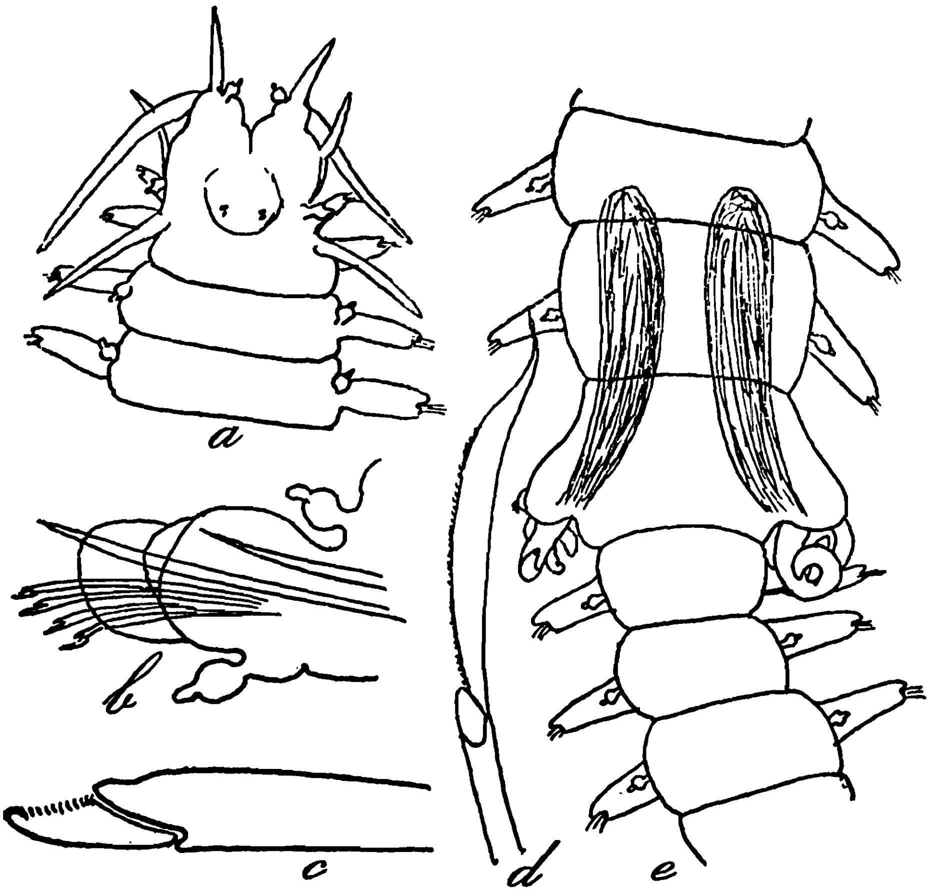


Fig. 35.—***Pisione oerstedi*** **Grube:** ***a,*** **anterior end** ×14; *b,* 23rd foot ×31 (after Ehlers); *c,* ventral bristle ×390; *d,* swimming epitocous bristle ×390; *e,* 38-43rd segments of the male, with genital papillae, ×39.

denticulate. Next segment, the first setigerous, with a long ventral cirrus directed forwards and a small globular dorsal one. The dorsal cirrus of the second setigerous segment is long and slender, the ventral one globular. Dorsal and ventral cirri globular on all the following segments. Feet uniramous, with a median aciculum and a smaller superior one. A single large simple seta and

3-4 inferior ones, which are stout, compound, with a short falcate, unidentate, terminal piece. *Mature females* with a fascicle of 3—4 very slender transparent compound epitocous setae with paddle-shaped terminal piece, which are inserted between the upper and lower setae. No genital papillae apparent. *Males,* with genital simple papillae and, when mature, multifid papillae and special organs on a number of segments, irregularly distributed.

Length: 20—40 mm. by 2 mm.

Colourless in spirit.

Occurrence: Ceylon.

Distribution: Pacific Ocean, Callas, Valparaiso, Indo-China; Indian Ocean, Ceylon.

Family CHRYSOPETALIDAE Ehlers.

Body short, elongated, with few or numerous segments, bearing on their dorsal side a fan or a transverse row of paleae. Prostomium with four eyes and three tentacles. Two or four pairs of tentacular cirri. Feet biramous, with dorsal cirri on every segment. Ventral setae compound.

Genus CHRYSOPETALUM Ehlers.

Body short, segments comparatively few. Prostomium oval, tentacles inserted on the prostomium. Two stout palps. First two segments partly fused, each carrying one pair of tentacular cirri. Next, dorsal ramus short, carrying only a fan of paleae which cover the greater part of the back. Stout dorsal cirri. Compound setae only on the ventral ramus.

57. **Chrysopetalum ehlersi** Gravier. (Fig. 36, *a—d*).

Chrysopetalum ehlersi, Gravier, 1901, p. 260, pl. X, figs. 150—151; Fauvel, 1939, p. 266; Gravely, 1927, p. 5.

Body short, very brittle. Median tentacle short, lateral tentacles pyriform. Four large eyes. A nuchal fold. First two setigerous segments with only dorsal paleae and no ventral setae. Dorsal cirri with a long ceratophore. Paleae slightly concave, broad, slightly enlarged under the pointed tip, with a row of teeth on each side. Ventral setae compound spinigerous, with a long striated shaft and a more or less long, slender, unidentate appendix.

Length: 6—15 mm. by 1 mm.

Colour: Yellowish, with golden paleae.

Occurrence: Krusadai Island, Pamban.

Distribution: Pacific Ocean, Indo-China; Indian Ocean, Gulf of Mannar, Red Sea.

Genus BHAWANIA Schmarda.

Body elongated, vermiform, very brittle, with numerous segments. Head very small, hidden. Paleae arranged

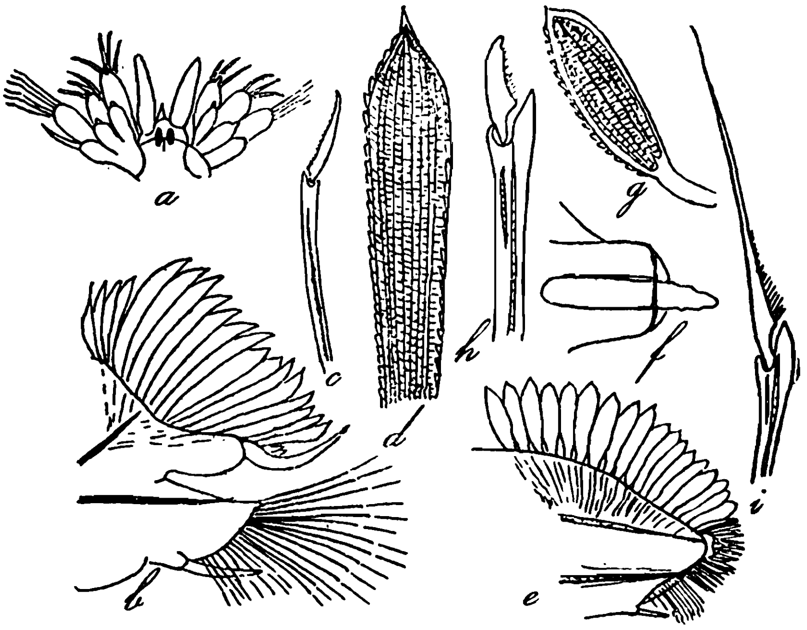


Fig. 36.—*Chrysopetalum ehlersi* Gravier: *a*, head, ventral side, enlarged; *b*, foot ×64; *c*, bristle ×191; *d*, palea ×320. *Bhawania cryptocephala* Gravier: *e*, foot, enlarged ×64; *f*, dorsal cirrus ×255; *g*, palea ×95; *h*, lower seta ×320; *i*, upper seta ×320 (after Gravier).

in transverse rows: they are denticulated only along one side. Ventral setae compound, of three kinds.

58. Bhawania cryptocephala Gravier. (Fig. 36, *e—i*).

Bhawania cryptocephala, Gravier, 1901, p. 263, pl. X, figs. 152—156: Potts, 1909, p. 328: Horst, 1917, p. 137: Fauvel, 1919, p. 347; 1932, p. 43; 1939, p. 266: Pruvot, 1930, p. 20.

? *Bhawania myriolepis*, Schmarda, 1861, p. 164, pl. XXXVII, figs. 323—325.

Body yellow, twisted, very brittle, entirely covered by the paleae. Head very small, hidden by the protruding anterior feet and the paleae, which are imbricated, arranged in dense transverse rows: they are yellow or brown, oval-elongate, striated transversely and longitud-

inally, serrated on one side and show prominent ridges with a beaded edge. Dorsal cirri digitiform, partly retractile. Ventral ramus bearing: (1) upper setae with long spinigerous terminal piece, (2) heterogomph falcigerous and (3) slender setae with an elongated smooth filiform appendix. Ventral cirrus short. The general appearance is like that of a *Sigalionid.*

Length: 80—100 mm. by 5 mm.

Occurrence: Burma coast, among sponges; Nicobar Islands, Nankauri Harbour, Camorta Island; Ceylon; Maldive Archipelago.

Distribution: Pacific Ocean, New Caledonia, Philippine Islands, Indo-China: Indian Ocean; Red Sea.

Family AMPHINOMIDAE Savigny.

Body elongated, square, or short, oval, depressed. Prostomium deeply set into the anterior segments. Three tentacles. Two palpal pads with subulate palpostyles (resembling a second pair of lateral tentacles). A caruncle. Parapodia biramous, with branchiae; one or two dorsal cirri on each side, a ventral cirrus (exceptionally uniramous with compound hooks). Setae simple, straight or furcate. Proboscis unarmed.

Key to genera

1. Branchiae pinnate	*Chloeia* Savigny, p. 94.
Branchiae bushy	2
2. Branchiae set in transverse rows of tufts ..	*Euphrosyne* Savigny, p. 101.
Branchiae in dense clusters	3
3. Two dorsal cirri on each foot	*Notopygos* Grube, p. 98.
A single dorsal cirrus on each foot	4
4. Eyes absent ..	*Benthoscolex* Horst, p. 93.
Eyes present	5
5. Caruncle small. Branchiae only on the anterior part of the body ..	6
Caruncle well developed. Branchiae up to the end of the body ..	7
6. Hooks on the first setigerous segment ..	*Paramphinome* Sars, p. 91.
No hooks on the first setigerous segment	*Pseudeurythoë* Fauvel, p. 85.

7. Caruncle heart-shaped. Short, hooked, ventral setae — *Amphinome* Bruguière, p. 81.
Caruncle trilobed. Ventral setae furcate — *Eurythoë* Kinberg, p. 82.

Genus AMPHINOME Bruguière.

Caruncle small, heart-shaped. Three tentacles. Ventral setae uncinate, short. Arborescent branchiae in dense clusters.

59. Amphinome rostrata (Pallas) (Fig. 37).

Amphinome rostrata, McIntosh, 1885, p. 21, pl. Ia, fig. 96; 1923, p. 190: Fauvel, 1914b, p. 87; 1930a, p. 10 (Synonymy); 1932, p. 44.

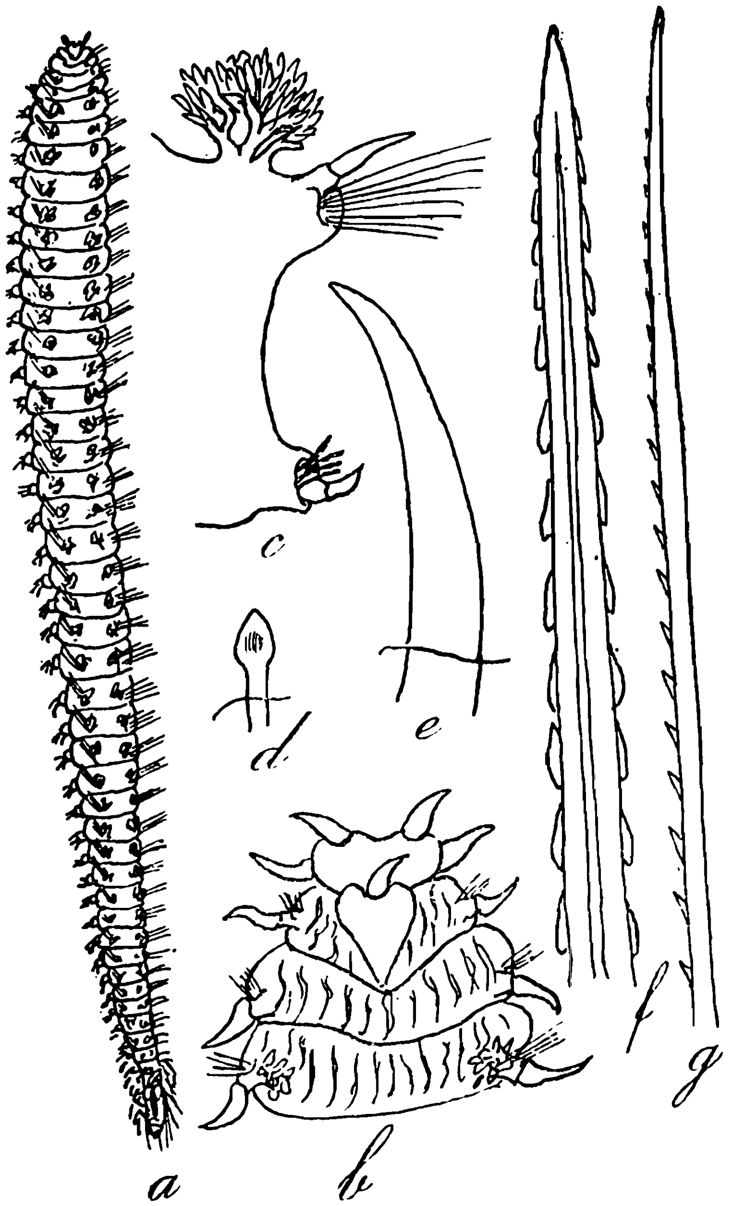


Fig. 37.—*Amphinome rostrata* (Pallas): *a*, dorsal side, slightly reduced; *b*, head, enlarged; *c*, foot ×4; *d*, ventral aciculum ×140; *e*, ventral bristle ×140; *f*, dorsal harpooned bristle ×140; *g*, dorsal, spinous bristle ×140.

Amphinome pallasii, Quatrefages, 1865, p. 344: Fauvel, 1914b, p. 85 (Bibliography); 1923, p. 128, fig. 46, *a–g*.
Pleione tetraedra, Milne-Edwards, 1849, pl. VII, fig. 1.

Body square in section. Prostomium small, rounded, with two eyes. Caruncle smooth or slightly plaited. Median tentacle short, inserted on the anterior margin of the caruncle. Lateral tentacles short, subulate. Palps conical. Bushy gills from the 2nd or 3rd setigerous segment. Dorsal cirrus inserted under the branchial cluster. Dorsal setae of two kinds: (1) long, slender, more or less serrated at the tip; (2) stouter bristles with lateral fangs (glochidiate setae, harpoon-shaped) Ventral setae few, 5–7 uncinate. Acicula with a terminal knob. On floating wrecks, amongst the *Lepas*.

Length: 200–400 mm. by 20–30 mm.

Colour: Body bluish-grey, cirri and gills red (rusty yellow in spirit).

Occurrence: Andaman Sea. 112 fms.; Nankauri Harbour, on a drifting log; Puri, Orissa.

Distribution: Pacific, Indian, and Atlantic Oceans, in their warm parts.

Remarks: *A. rostrata* and *A. pallasii* are synonymous. A careful comparison of specimens from Indian and Atlantic Oceans has failed to reveal any specific differences.

Genus EURYTHOË Kinberg.

Body elongate, square in section. Prostomium large, rounded, with four eyes. Three subulate tentacles, two large pad-like palpophores with subulate tentacle-like palpostyles. Caruncle consisting of a sinuous crest with vertical folds along its lateral sides: Branchiae ramified, mostly bifid, generally short and thick. Dorsal setae usually longer, of three kinds: (1) bifid, the shorter arm being a spur; (2) harpoon-shaped; (3) sword-shaped. Acicula lanceolate. Anus dorsal, extending over several segments or terminal.

Key to the species of Eurythoë.

1. Branchiae on the first setigerous segment . .	*matthaii* Bindra, p. 84.
Branchiae on the 2nd or 3rd setigerous segment	2
2. Branchiae on the 3rd setigerous segment .	*parvecarunculate* Horst, p. 85.
Branchiae on the 2nd setigerous segment	*complanata* (Pallas), p. 83.

60. Eurythoë complanata (Pallas) (Fig. 38, *b–m*)

Eurythoë complanata Pallas, Augener, 1913, p. 87: Fauvel: 1930 p. 45; 1943, p. 5: Bindra, 1927, p. 9, pl. I, figs. 5–6, pl. II, fig. 1: Pruvot, 1930, p. 23.

Eurythoë alcyonia Kinberg, Gravier, 1901, p. 248, pl. IX, figs. 140 –143; pl. X, figs. 144–146: Pruvot, 1930, p. 21.

Eurythoë pacifica, Kinberg, 1857, p. 36, pl. XII, fig. 11.

Eurythoë laevisetis, Fauvel, 1914a, p. VIII, figs. 28–30, 33–7.

Eurythoë latissima Schmarda, Willey, 1905, p. 243.

Eurythoë karachiensis, Bindra, 1927, p. 13, pl. II, fig. 6.

Amphinome indica, Schmarda, 1861, p. 142, pl. XXXV, fig. 294.

Amphinome longicirra, Schmarda, 1861, p. 142, pl. XXXIV, fig. 292.

Amphinome macrotricha, Schmarda, 1861, p. 144, pl. XXXIV, fig. 290.

Amphinome eucopochaeta, Schmarda, 1861, p. 153, pl. XXXV, fig. 293.

Branchiae commencing on the second segment. Four very conspicuous eyes. Caruncle terminating on third or fourth segment, lateral lobes more or less hidden in

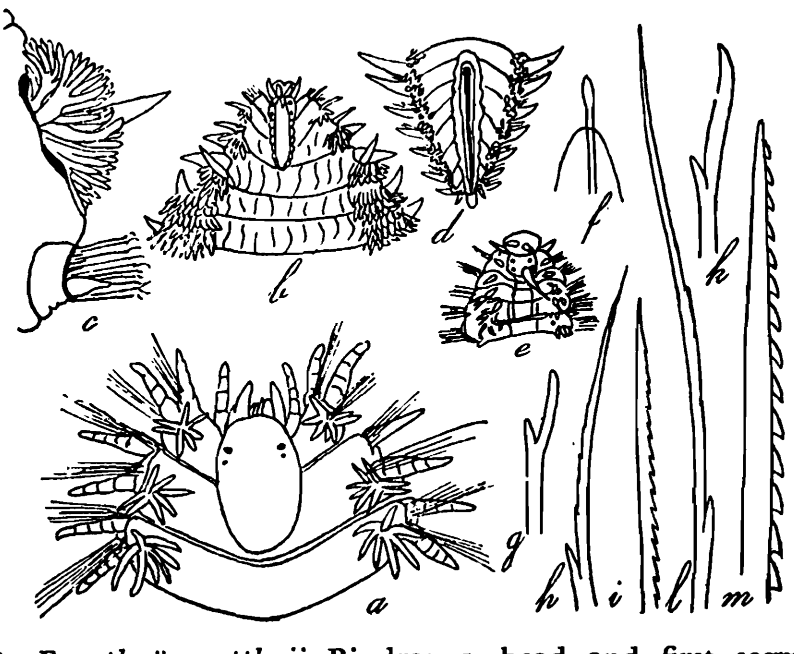


Fig. 38.—*Eurythoë matthaii* Bindra: *a,* head and first segment ×16 (after Bindra). *E. complanata* (Pallas); *b,* head and anterior segments; *c,* foot; *d,* dorsal view of anal region (after Gravier); *k,* ventral bristle; *l,* dorsal bristle ×333; *m,* harpooned bristle ×333. *E. parvecarunculata* Horst; *e,* anterior region; *f,* aciculum (after Horst); *g,* ventral bristle; *h-i,* dorsal bristles.

grooves under the smooth lobe. About five buccal segments. Dorsal setae very variable in length, of three kinds: (1) long calcareous setae, with an elongate slen-

der tip, more or less serrated, and a small spur at the base; (2) large straight, harpooned, glochidiate setae, with lateral rows of easily deciduous teeth, and (3) stout, straight, *smooth* setae. Two kinds of ventral setae: (1) stout furcate setae with unequal arms, the larger one smooth, or slightly serrated on young specimens, and (2) a few sub-furcate setae with one of the arms thin and greatly elongated. Acucula short, spear-headed.

Length: 50—200 mm. by 10—15 mm.

Colour: Gills red, setae alabaster-white.

Occurrence: Mergui, Andaman Islands, India, Ceylon, Maldive Archipelago, Arabian Sea.

Distribution: On coral reefs of the whole tropical area of Pacific, Indian and Atlantic Oceans.

Remarks: The setae, in life, are very brittle, and consequently vary much in length, according to the environment. As they are calcareous, they are often damaged in spirit, formol and other reagents, becoming soft, woolly and losing their lateral teeth. Moreover, many specimens, having undergone regenerations which are very frequent in this species, present marked modifications in the proportions and appearances of the head, the number of buccal and anal segments, the shape of the body, of the anal funnel, and the length of the tentacles. Contraction, due to the fixatives, also alters the appearance of the caruncle to a large extent. Such is the explanation of its having been described under so many names. (See: Fauvel, 1943a, p. 5).

61. Eurythoë matthaii Bindra. (Fig. 38, *a*).

Eurythoë matthaii, Bindra, 1927, p. 12, pl. II, figs. 4—5.

Body rectangular in cross section. Branchiae beginning on the first segment. Buccal segments four. Caruncle oval, extending over the first two segments. Anus terminal. Median tentacle shorter than the paired tentacles. Eyes hidden by the anterior margin of the caruncle; anterior ones larger than the posterior. Harpoon-shaped setae well developed, reaching the length of the bifid setae.

Length: 65—110 mm. by 5—8 mm.

Occurrence: Karachi.

Distribution: India.

62. Eurythoë parvecarunculata Horst. (Fig. 38, *e—i*)

Eurythoë parvecarunculata, Horst, 1912, p. 37, pl. X, figs. 1—5: Augener, 1916, p. 90, pl. II, fig. 3, pl. III, figs. 37—38: Fauvel, 1923, p. 9; 1927, p. 525, fig. 1; 1932, p. 46.

? *Amphinome djiboutiensis,* Gravier, 1901, p. 245, figs. 249—253, pl. IX, figs. 137—139.

? *Amphinome maldivensis,* Potts, 1909, p. 263, pl. XLV, figs. 14—15, pl. XLVI, figs. 12—17.

Eurythoë heterotricha, Potts, 1909, p. 369, pl. XLV, figs. 16—17, pl. XLVI, figs. 18—19.

Branchiae commencing on the third segment. Rounded cephalic lobe with a large heart-shape palpal part and four eyes; upon its posterior border it bears a long unpaired antenna; the two anterior antennae are much shorter. The subulate palpo-styles of the palps are somewhat shorter than the lateral antennae. The caruncle is a small oval process only extending over the first segment. The strongly ramified branchiae are most developed in the anterior part of the body, decreasing posteriorly. The acicula have an elongated oval tip. Dorsal setae of two kinds: (1) slender elongated, bifurcated, with a long limb smooth or coarsely denticulated along its internal border, and a short limb often reduced to a mere spur, and (2) short, stout, harpoon-shaped bristles. Ventral setae furcate, with the longer limb bent backwards and provided with a few faint denticulations. They are associated with a few slender elongate setae with a spur-like short limb and a long limb smooth, or faintly denticulate.

Length: 30—220 mm. by 3—14 mm.

Occurrence: Port Blair, Andamans; Chilka Lake.

Distribution: Malay Archipelago, Bay of Bengal, India, Atlantic Ocean, Cameroon, Guiana, ? Red Sea, Maldives.

Remarks: If *Amphinome djiboutiensis* Gravier and *A. maldivensis* Potts, which really belong to the genus *Eurythoë,* be also conspecific with *E. parvecarunculata* Horst, Gravier's name should have priority.

Genus PSEUDEURYTHOË Fauvel.

Body elongated, square in cross-section of the anterior part. Prostomium rounded. Two pairs of eyes. Caruncle reduced to a small knob, deeply set into the first segment. Three tentacles. Palps cushion-like, with subu-

late palpostyles. Feet biramous, with dorsal and ventral divisions far apart. Dorsal setae of two kinds: (1) harpoon-shaped; (2) capillary. Ventral setae: (1) short, bifurcate; (2) capillary, with or without a short basal spur. Each foot bearing a dorsal and a ventral cirrus. *Gill-tufts limited to the anterior part of the body.*

Remarks: This genus is a connecting link between *Eurythoë* and *Paramphinome.*

Key to species of Pseudeurythoë.

1. Prostomium sunk into the first segments	2
Prostomium not sunk into the first segments	3
2. A very small caruncle	*microcephala* Fauvel, p. 88
No trace of a caruncle	*acarunculata* Monro, p. 89.
3. Head broader than long, not heart-shaped	*ambigua* Monro, p. 90.
Head heart-shaped posteriorly	*paucibranchiata* Fauvel, p. 86.

63. **Pseudeurythoë paucibranchiata** Fauvel. (Figs. 39, *a, b;* 40, *a—e*).

Pseudeurythoë paucibranchiata, Fauvel, 1932, p. 48, fig. 8, pl. I, figs. 3—4.

Body more or less moniliform posteriorly. Prostomium globular, slightly bilobed anteriorly, raised posteriorly into a heart-shaped lobe. Lateral tentacles articulate. Median tentacle inserted at the back of the heart-shaped lobe which bears two small, inconspicuous eyes on its anterior border. Caruncle reduced to a very small lobe, set into the first setigerous segment. Palps cushion-like, with articulate palpostyles. Branchiae from the 3rd setigerous segment to the 25th, in clusters of filaments. Dorsal setae: (1) long capillary without spur; (2) short slender capillary; (3) stout, harpoon-shaped. Ventral setae: (1) upper trifurcate, serrated, with long spur; (2) very long smooth capillary, without spur; (3) furcate, with long limb serrated.

Length: 25 mm. by 2 mm.

Occurrence: Ain Musa, Gulf of Suez.

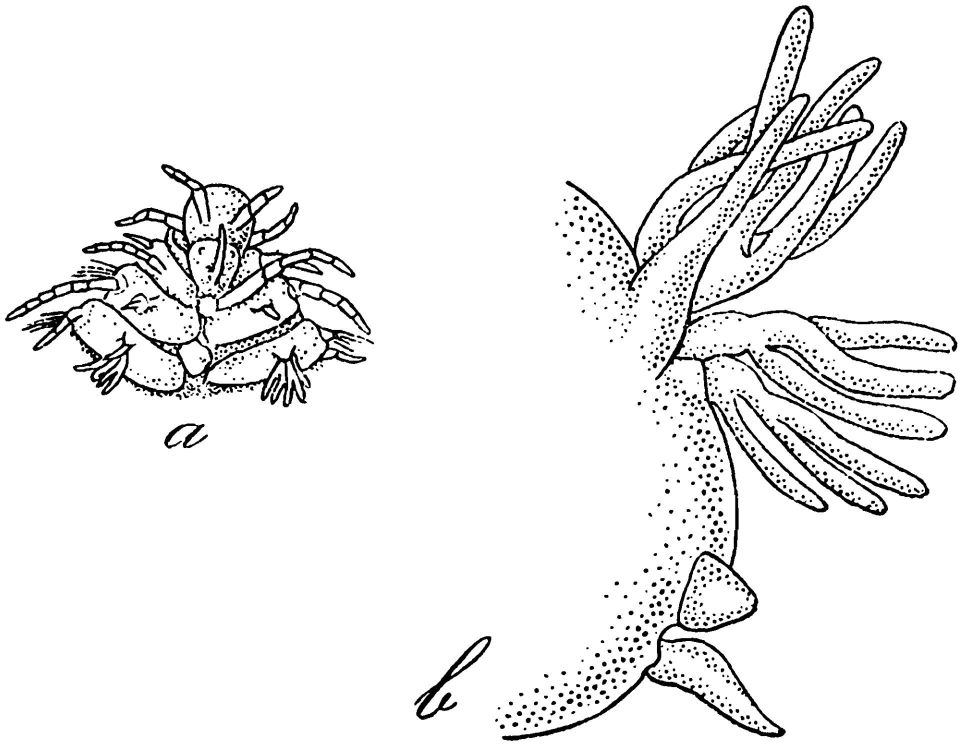


Fig. 39.—*Pseudeurythoë paucibranchiata* Fauvel: *a*, head, ×18; *b* branchiferous foot ×40 (from Fauvel, 1932).

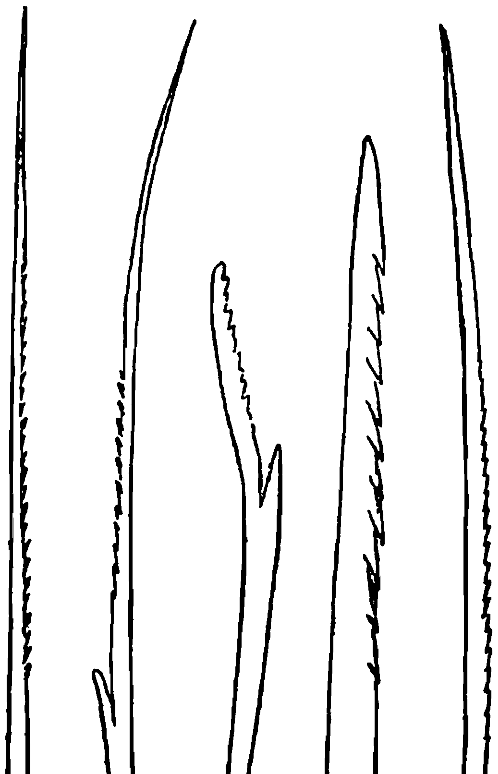


Fig. 40.—*Pseudeurythoë paucibranchiata* Fauvel: *a*, ventral serrated capillary bristle ×520; *b*, upper ventral furcate bristle ×520; *c*, inferior vetnral forked bristle ×520; *d*, harpoon-shaped bristle ×380; *e*, posterior dorsal serrate bristle ×520 (from Fauvel, 1932).

64. **Pseudeurythoë microcephala** Fauvel. (**Figs. 41, *a—d*; 42, *a—e***).

Pseudeurythoë microcephala, Fauvel, 1932, p. 49, fig. 9, pl. I, figs. 5—8.

Body moniliform posteriorly. Head very small, entirely retracted into the first segment. Prostomium longer than broad, rounded anteriorly, enlarged and quadrangular posteriorly. Caruncle square, very small, deeply

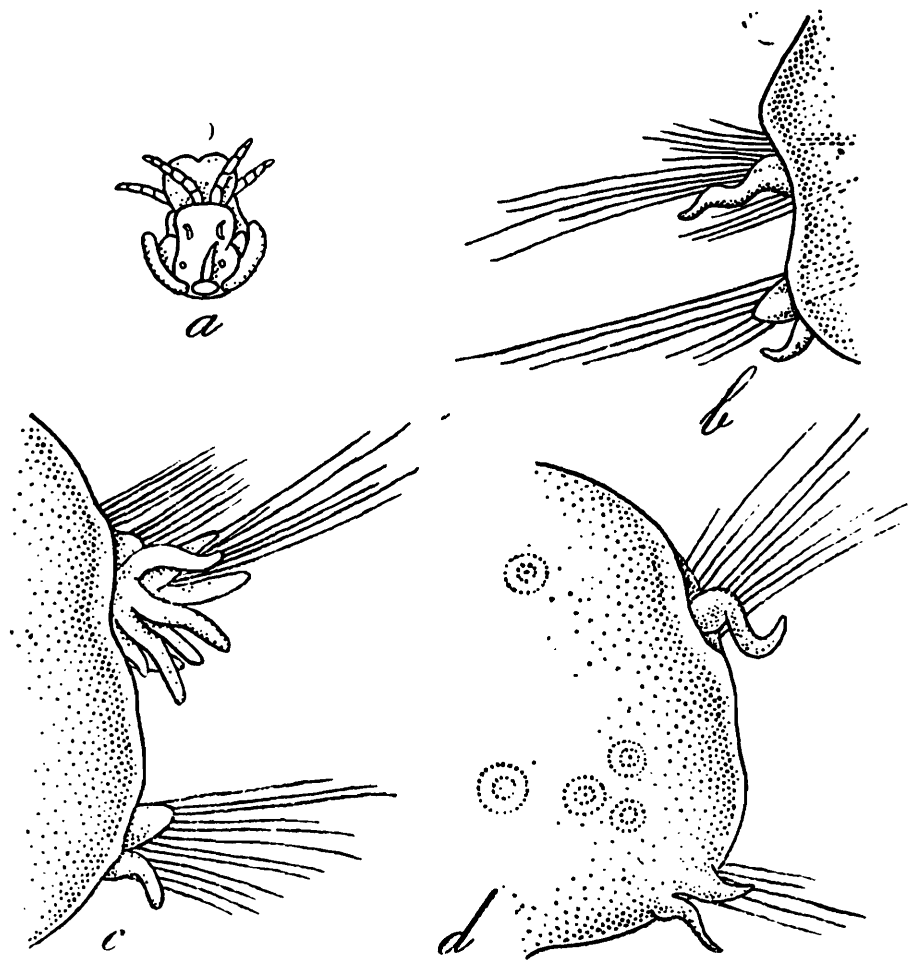


Fig. 41.—*Pseudeurythoë microcephala* Fauvel: *a,* head ×20; *b,* foot from the middle of the body, male ×40; *c,* branchiferous foot, male, ×40; *d,* foot from the middle part of the body, female, ×40.

hidden under the protruding border of the next segment. Two pairs of reddish eyes. Median tentacle filiform, inserted far back between the posterior eyes. Lateral tentacles subulate, faintly articulated. Palpostyles about the same length. No hooks on the first setigerous segments. Branchiae from the 3rd setigerous segment to the 25th; they are bushy. Dorsal setae: (1) long, slender, smooth, capillary, without spur; (2) harpoon-shaped.

Ventral setae: (1) long, serrated, capillary, without spur; (2) furcate with longer limb boldly serrated.

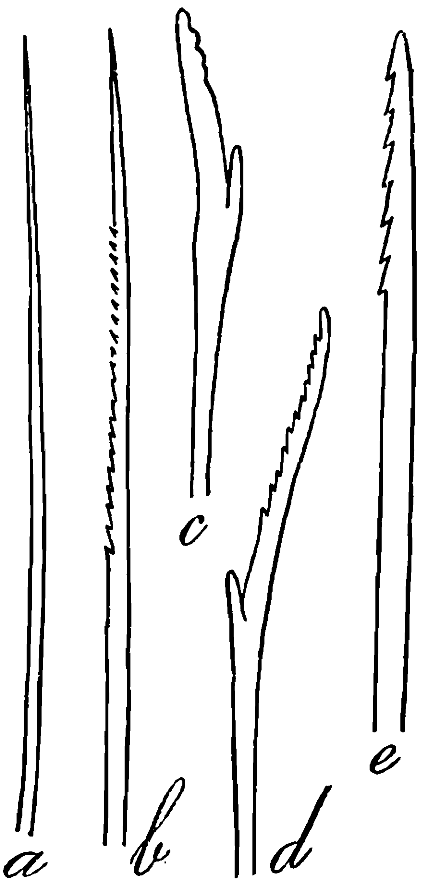


Fig. 42.—*Pseudeurythoë microcephala* Fauvel: *a*, smooth dorsal bristle ×380; *b*, serrated capillary ventral bristle ×530; *c*, *d*, furcate ventral bristles ×530; *e*, harpoon-shaped bristle ×380.

Differs from *P. paucibranchiata* Fauvel chiefly by: (1) head very small; (2) prostomium sunk; (3) absence of basal spur on long setae of both rami.

Length: 30 mm. by 2 mm.

Occurrence: From reef-flat between Hululu and Heratera, Addu Atoll, Maldive Archipelago.

65. **Pseudeurythoë acarunculata** Monro. (Fig. 43, *d*—*m*).

Pseudeurythoë acarunculata, Monro, 1937, p. 249, fig. 2.

Body slender and vermiform. Head deeply retracted into the first segments, more or less rectangular in outline and divided into two regions by a transverse groove. The hinder part of the prostomium is slightly broader than long and cut off squarely behind. *No trace of a caruncle is visible.* A kind of nuchal pit present. Two pairs of eyes. The median tentacle on a level with the posterior

pair, the lateral tentacles just before the anterior pair. Palpostyles lateral. *No hooks on the first setigerous segment.* Branchiae from the 4th setigerous segment to about the 50th: they are bushy. A long dorsal cirrus. Dorsal setae: (1) very fine, smooth, capillary bristles; (2) harpoon-shaped. Ventral setae: (1) very long capilary bristles, with a smooth spur; (2) short, stout, furcate bristles with the longer limb serrated (no long ventral capillary without spur)

Length: 30 mm. by 1 mm.

Occurrence: Maldive Archipelago.

66. Pseudeurythoë ambigua Monro. (Fig. 43, *i—m*).

Pseudeurythoë ambigua, Monro, 1937, p. 251, fig. 3.

Shape slender and vermiform, tapering rather sharply in front and gradually behind. Head rounded in front,

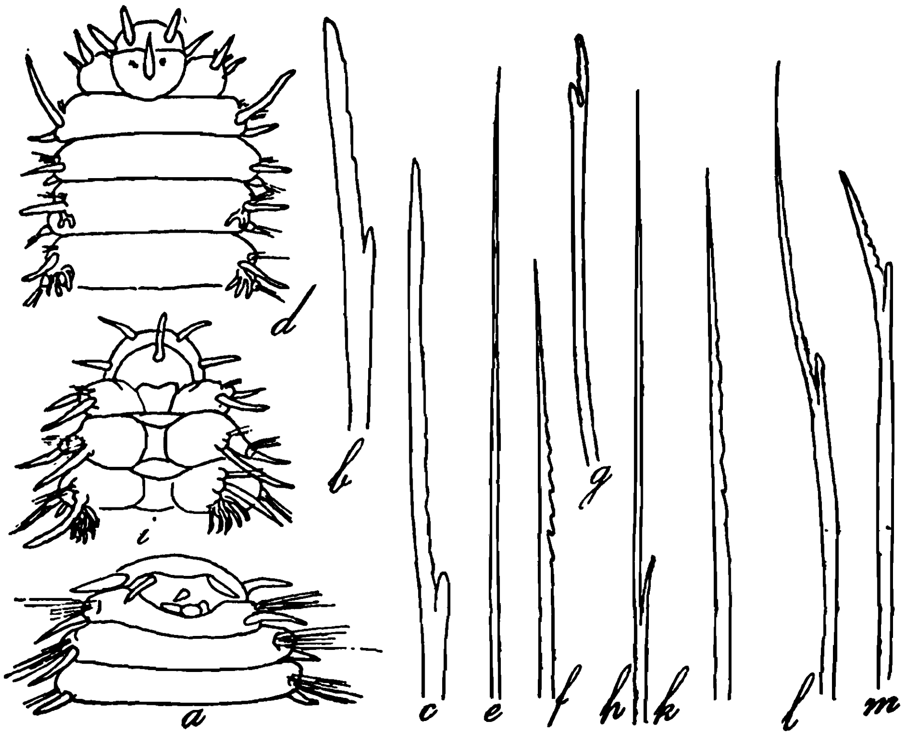


Fig. 43.—*Benthoscolex coecus* Horst: a, dorsal view of anterior segments ×16; *b*, short ventral bristle ×191; *c*, elongated ventral bristle ×191 (after Horst). *Pseudeurythoë acarunculata* Monro: *d*, anterior end from above; *e*, *f*, dorsal bristles *g*, short ventral bristle; *h*, fine ventral bristle. *Ps. ambigua* Monro: *i*, anterior end, from above, eyes not shown; *k*, dorsal bristle; *l*, *m*, ventral bristles (after Monro).

divided into two regions by a transverse groove running a little way behind the lateral tentacles, and more or less rectangular; broader than long behind: the hinder part is *not heart-shaped* as in *Ps. paucibranchiata* Fauvel. The

caruncle is a rounded pad lying in the first chaetiger. Two pairs of minute, inconspicuous eyes. Branchiae from the 3rd setigerous segment to the 43rd, large and conspicuous. Dorsal cirri long. Dorsal setae: (1) long, smooth capillary; (2) harpoon-shaped. Ventral setae: (1) upper bifurcate, with long spur; (2) very long capillary; (3) stout short furcate, with longer limb serrated. (Bristles as in *Ps. paucibranchiata.*)

Length: up to 47 mm. by 2 mm.

Occurrence: Maldive Archipelago.

Distribution: Gulf of Panama; Maldive Archipelago.

Genus PARAMPHINOME Sars.

Body moderately elongate, vermiform; segments few. Prostomium rounded, no eyes. Caruncle small. Three tentacles. Palps cushion-like, with subulate palpostyles. Feet biramous, with dorsal and ventral divisions far apart. Dorsal setae of two kinds: (1) harpoon-shaped and (2) capillary. Ventral setae also of two kinds: (1) short, bifurcate; and (2) long, capillary, with, or without, basal spur. Acicula hastate. *Two strong curved hooks on each side of the first setigerous segment.* Gills only on anterior segments. Anus terminal.

67. **Paramphinome indica** Fauvel. (Figs. 44, *a–h*; 45 *a–f*).

Paramphinome indica, Fauvel, 1932, p. 51, text-fig. 10, pl. I, figs. 9–16.

Body cylindrical, slightly flattened anteriorly. Prostomium eyeless, globular, rounded anteriorly, very slightly bilobed backwards, with a very small oval or triangular caruncle set into the first segment. Two filiform lateral tentacles; median tentacle long, raised, inserted at the back. Palpostyles tentacle-like. On the first setigerous segment a long dorsal cirrus and a slightly shorter ventral one, and, in front of the setae, *two strong, curved, transparent hooks.* No ventral cirrus on the second setigerous segment: on the third and the following ones both a dorsal and a ventral cirrus. Branchiae 10–13 pairs, from the 4th setigerous to the 13th–16th; they are very large, entirely covering the body and feet, divided into many branches bearing lateral filaments, simple or bifurcate. Both rami wide apart. In the posterior abranchiate region, of 10–13 segments, a short blunt dorsal process, with a long cirrus and a tuft of capillary setae, a larger ventral

ramus with two fillets, an anterior conical, and a posterior rounded, a little shorter; a ventral cirrus and very long setae. Dorsal setae of two kinds: (1) large, straight, harpoon-shaped bristles, (2) long and slender capillary. Ventral setae also of two types: (1) short, with tip of the shaft bifurcate, one of the limbs large, curved, serrated,

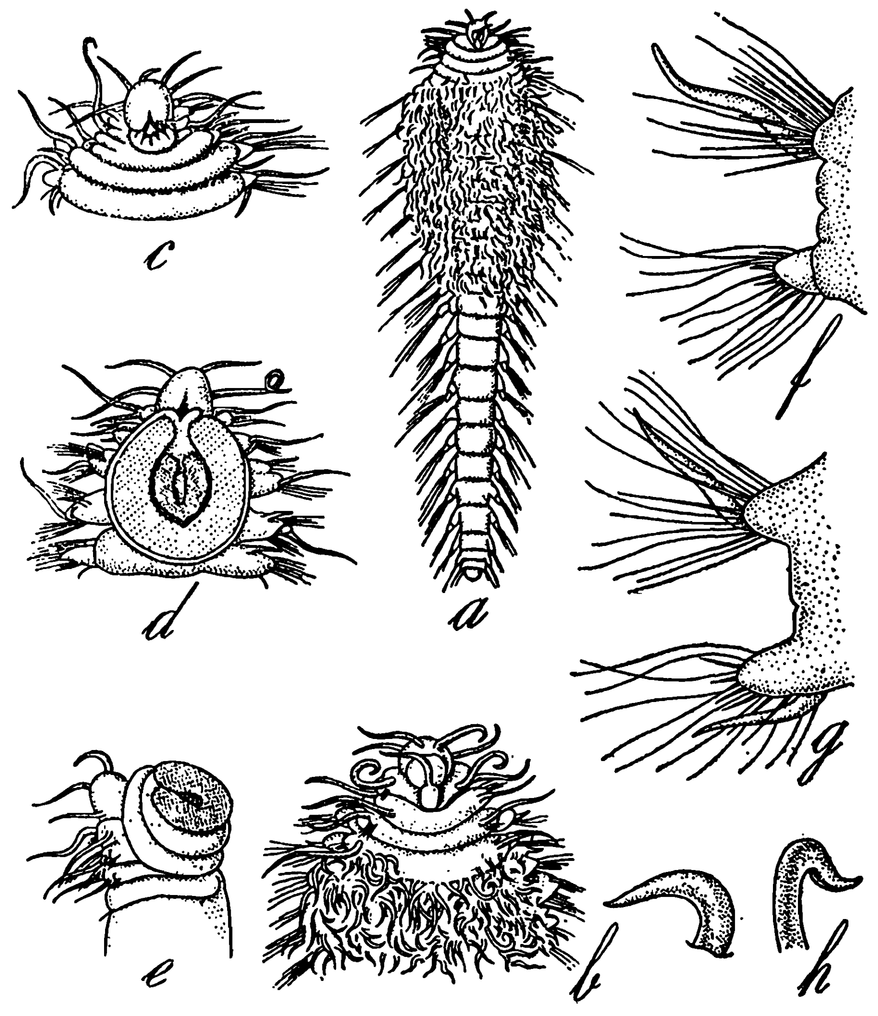


Fig. 44.—*Paramphinome indica* Fauvel: *a*, dorsal view ×3; *b*, anterior end, dorsal view ×7; *c*, head, ventral view ×7; *d*, proboscis extruded ×7; *e*, proboscis extruded, side view ×7; *f*, third setigerous foot ×25; *g*, second setigerous foot ×25; *h*, hooks from 1st setigerous foot ×185.

the other much smaller, slender and smooth, and (2) longer and slender serrate setae, with a small basal spur. Acicula hastate. Anus terminal.

Length: 15—20 mm. by 4—5 mm.

Colourless in spirit.

Occurrence: Arabian Sea, 530 fms.; Cape Comorin 881—891 fms. Green mud.

Genus BENTHOSCOLEX Horst.

Body oblong oval, agreeing in general appearance with that of *Chloeia.* Caruncle short, with three parallel longitudinal ridges. Eyes absent. Branchiae commencing on the 6th segment, strongly developed on the posterior segments. Furcate bristles. An unpaired anal cirrus (Horst).

68. **Benthoscolex caecus** Horst. (Fig. 43, *a—c*).

Benthoscolex caecus, Horst, 1912, p. 38, pl. X, figs. 11—16.

Body tapering in front and behind. Prostomium small, heart-shaped, with a short caruncle consisting of

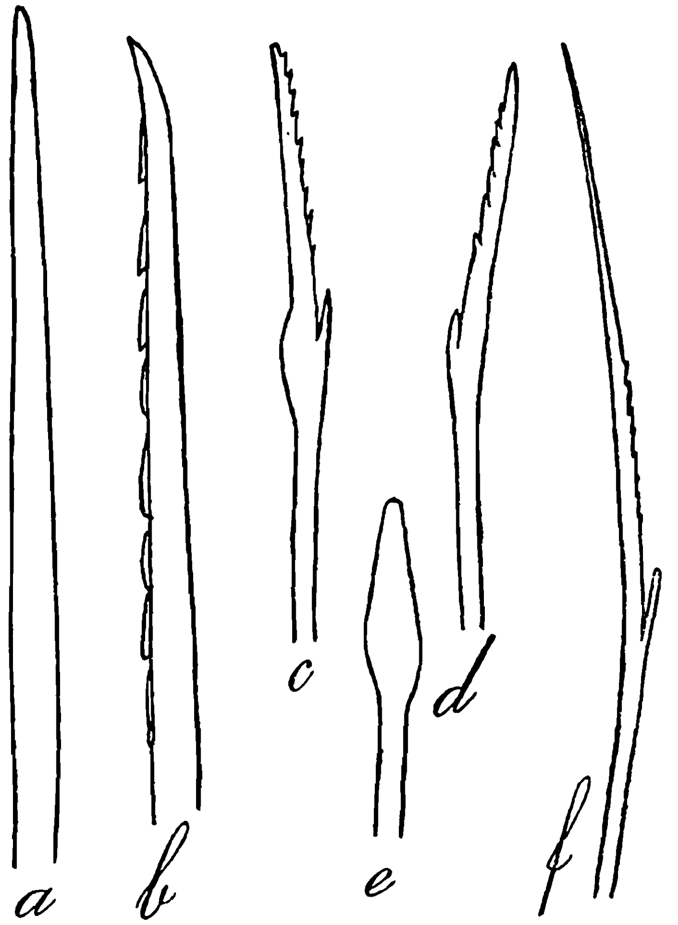


Fig. 45.—*Paramphinome indica* Fauvel: *a,* large dorsal smooth bristle ×150; *b,* harpoon-shaped bristle from hind foot ×380; *c,* furcate ventral bristle from 3rd setigerous segment ×380; *d,* furcate ventral bristle ×380; *e,* acicular bristle ×380; *f,* slender furcate capillary seta ×380.

three longitudinal ridges, that do not extend beyond the first segment. *No eyes present.* A median tentacle in front. Lateral tentacles nearly as long as the median one, set on each side of the median dorsal line. Cushion-like palpophores with tentacle-like palpostyles. An unpaired

anal papilla, faintly emarginated and a subterminal dorsal anus. Well developed branchiae from the 6th segment, in dense clusters of numerous filaments; on the last 5—6 segments they are more numerous, crossing over the back and forming large bushy terminal clusters. Dorsal cirri about the length of the setae, ventral cirri shorter, with the exception of the last 3—4 ones which are filiform and very long. Dorsal and ventral bundles of bristles stiff and alabaster-white. Ventral ramus with only bifurcated setae as follows: (1) with a long limb, plain, or with 1—3 denticulations, and a short limb, like a spine, and (2) much more slender setae with a long limb, coarsely denticulated, and a short limb like a spur. Dorsal setae alike, but fewer and shorter and mixed with harpoon-shaped ones.

Length: 34—37 mm. by 10 mm.

Occurrence: Ceylon; Laccadive Sea.

Distribution: Flores Sea; Ceylon; Laccadive Sea.

Genus CHLOEIA Savigny.

Body oval, caruncle composed of a plaited crest, arising from a horizontal plate, folded along its margin. *Pinnate branchiae.* All bristles more or less bifurcated; the ventral ones smooth, those of the dorsal fascicle, in some anterior segments, smooth, in those of the posterior body-region, serrated along the outer border. Two anal cirri sausage- or finger-shaped. Anus in the last segment. Only one pair of dorsal cirri on each segment.

Key to the species of Chloeia.

1. Back with median purple spots	2
Back without median spots	4
2. Median dorsal spots more or less circular	*flava* Pallas, p. 96.
Median spots not circular	3
3. Median spots T or Y-shaped	*parva* Baird, p. 96.
Median spots inverted T-shaped	*violacea* Horst, p. 95.
Median dorsal spots resembling an amphora	*amphora* Horst, p. 96.
4. Uniformly reddish pink, without any dorsal pattern	*rosea* Potts, p. 97.
Back uniformly dark-coloured, or with a couple of thin, longitudinal purple stripes	*fusca* McIntosh, p. 97.

69. Chloeia violacea Horst. (Fig. 46, *e*)

Chloeia violacea, Horst, 1912, p. 22, pl. VI, fig. 8, pl. VIII, figs. 8 —11: Monro, 1937, p. 253.

Body pale yellow or greyish brown. In each segment, a violet or orange spot shaped like an inverted T, the transverse arm of which lies just in front of the hinder intersegmental groove. Dorsal cirri purple, and also a

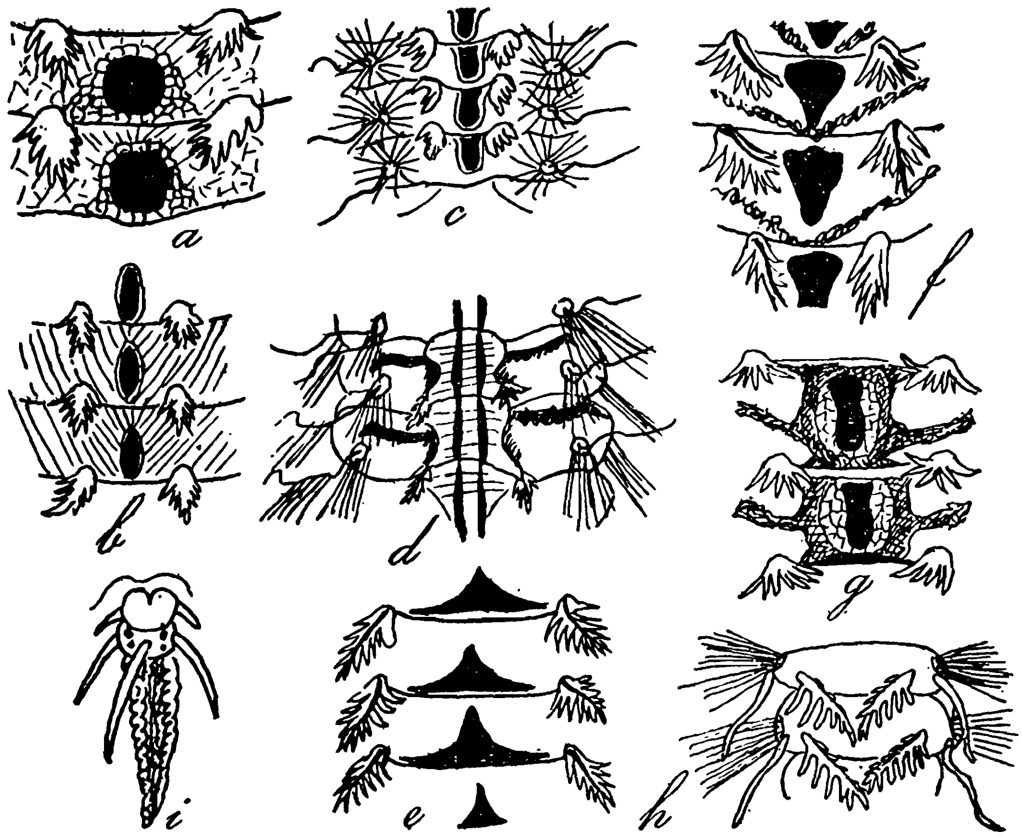


Fig. 46.—Dorsal patterns of *Chloeia* species: *a, Ch: flava* (Pallass) ×4; *b,* var. *pulchella* ×10; *c, Ch. amphora* Horst ×5; *d, Ch. fusca* McIntosh ×8; *e, Ch. violacea* Horst ×8; *f, Ch. parva* Baird ×6; *g, Ch. conspicua* ×4 (after Horst); *h, Ch. rosea* Potts, two middle segments (after Potts); *i, Ch. flava* (Pallas) head and caruncle, enlarged.

violet-stripe runs over the middle of the caruncle which extends upon the 4th segment. First branchia on the 4th segment.

Length: 9—20 mm. by 2—5 mm.

Occurrence: Gulf of Oman.

Distribution: Malay Archipelago; Gulf of Oman.

70. **Chloeia flava** Pallas. (Fig. 46, *d*).

Chloeia flava, McIntosh, 1885, p. 8, pl. III, figs. 1–3: Horst, 1912, p. 18, pl. XII, fig. 2: Fauvel, 1932, p. 55.

Chloeia capillata, Milne-Edwards, 1849, pl. IX.

Chloeia incerta, Quatrefages, 1865, p. 388.

Chloeia ceylonica, Grube, 1874, p. 325.

Chloeia tumida, Baird, 1870, p. 232, pl. IV, fig. 7, *a–d*.

Median dorsal purple spots varying in shape from a narrow ellipse to a circle. Setae varying from almost pure white to a bright yellow or pale green. Tentacles and dorsal cirri more or less violet or deep purple. Branchiae unpigmented or brown. Caruncle extends posteriorly to the commencement of the 4th segment and ends with a free tapering extremity.

Length: 100–120 mm. by 4 mm.

Occurrence: Singapore; Andaman Islands; Bay ot Bengal, Ceylon, Mandapam, Palk Strait. At Port Blair caught on a fishing line, on hooks baited with meat. Feeds on small crabs, etc.

Distribution: Japan, Pacific and Indian Oceans.

71. **Chloeia parva** Baird. (Fig. 46, *f*).

Chloeia parva, Baird, 1870, p. 233, pl. IV, fig. 8, *a–b*: Horst, 1912, p. 19, pl. VII, fig. 4, pl. VIII, figs. 1–3: Fauvel, 1932, p. 56.

Chloeia merguiensis, Beddard, 1887, p. 258, pl. XXI, figs. 2, 8, 9.

Body tapering posteriorly. Along the centre of the back, on each segment, there is a dark mark in shape somewhat like the Roman T, or rather the Greek Y. The caruncle extends to the anterior part of the 6th segment and its crest is surmounted with a black wavy line.

Length: 20–70 mm.

Occurrence: Penang; Andaman Islands; Sandheads, Mouth of Hughli River; Chandipur, Balasore, Orissa; Vizagapatam; Ceylon.

Distribution: Pacific Ocean, New Guinea, Java; Indian Ocean, Sumatra, Mergui, Andaman Islands, West Coast of India, Gulf of Oman.

72. **Chloeia amphora** Horst. (Fig. 46, *c*).

Chloeia amphora, Horst, 1912, p. 21, pl. VII, fig. 6, pl. VIII, figs. 6–7: Fauvel, 1932, p. 56.

Each segment shows in the middle a violet spot, somewhat resembling a roman *Amphora,* surrounded by a white band. The dorsal cirri are dark-violet, the ventral ones colourless. The caruncle bears about 20 lateral folds and extends to the anterior border of the 4th segment (Horst)

Length: 16–26 mm. by 7 mm., without the bristles. 26 segments.

Occurrence: Port Blair, Andaman Islands; Nankauri Harbour, Octavia Bay, Nicobar Islands.

Distribution: Malay Archipelago; Andaman and Nicobar Islands.

73. **Chloeia fusca** McIntosh. (Fig. 46, *d*)

Chloeia fusca, McIntosh, 1885, p. 14, pl. II, figs. 1–2: Potts, 1909, p. 356, pl. XLV, figs. 1–2: Horst, 1912, p. 22, pl. VII, fig. 7: Monro, 1924, p. 72: Fauvel, 1932, p. 56.

Chloeia longisetosa, Potts, 1909, p. 357, pl. XLV, fig. 5.

Back uniformly dusky brown, or purple-violet, or pale ground colour with a couple of longitudinal purple stripes near the dorsal middle line. Beneath each dorsal bundle of bristles is a purple ring shading off into orange; the dorsal cirri are dark-purple.

Remarks: *Chloeia longisetosa* is the epitocous state of *Ch. fusca.*

Length: 10–20 mm. by 4 mm.

Occurrence: Nankauri Harbour, Octavia Bay; Cape Comorin 556 fms.; Maldive Archipelago.

Distribution: Australia, China, Bay of Bengal, Amirante Islands.

74. **Chloeia rosea** Potts. (Fig. 46, *h*)

Chloeia rosea, Potts, 1909, p. 357, pl. XLV, fig. 3.

Body fusiform in shape, of a uniform reddish pink, even the setae being of the same colour. The branchiae are exceptionally well-developed and overlap the middle line. "It is very noticeable how closely this species adheres to the *C. fusca* type. The only differences from the original species are but trifling, *viz.,* coloration, structure and arrangement of gills and the absence of a single type of seta" (Potts). It is probably a young form, or a colour variety of *C. fusca.*

Length: 11 mm. by 3 mm., 20 segments.

Occurrence: Burma; Bay of Bengal; Arabian Sea; Persian Gulf.

Distribution: Bay of Bengal; Arabian Sea; Persian Gulf; Amirante Islands.

Genus NOTOPYGOS Grube.

Body oval. Caruncle composed of a plaited crest arising from a horizontal plate, folded along its margin. Branchiae ramified, *not pinnate*. An accessory dorsal cirrus at the proximal side of each branchia. All bristles bifurcated, smooth or denticulated. Two anal club-shaped cirri. Anus dorsal, subterminal.

Key to the species of Notopygos.

1. A triangular brownish area on the back ..	*labiatus* McIntosh, p. 99.
A chequered pattern on the back	2
2. Caruncle rounded posteriorly, with 30 marginal folds on each side	*gigas* Horst, p. 98.
Crest of the caruncle separated from the wings by a smooth, linear, pigmented area on each side, obscured under the lax folds of the wing	*hispidus* Potts, p. 100.
Smooth pigmented lateral area of the caruncle always to be seen	*variabilis* Potts, p. 100.

75. Notopygos gigas Horst. (Fig. 47, *a—c*)

Notopygos gigas, Horst, 1912, p. 26, pl. IX, figs. 1—3: Augener, 1926, p. 439.

Body large, oblong oval, 33—36 segments. Pale buff, in the middle of the dorsum brown or violet, irregularly interrupted by a great number of white lines crossing each other in various directions; a dark band occurs around the base of each notopodium, and the main stem of the branchiae is also dusky coloured. Caruncle extending to the anterior part of the 6th segment, rounded posteriorly and with 30 marginal folds on each side. Anterior pair of eyes longer than the posterior one. Anus on the anterior of 25th segment, usually at the apex of a conical papilla. Bristles long and vitreous, both dorsal and ventral bifurcate, smooth, with a yellow tip on the first three segments only, denticulated. Setae with rather divergent fork.

Length: 45—75 mm.

Occurrence: Ceylon, Galle, Trincomali.

Distribution: Malaya Archipelago; India.

76. Notopygos labiatus McIntosh.

Notopygos labiatus, McIntosh, 1885, p. 19; pl. II, fig. 6, pl. IV, fig. 2, pl. IIa, figs. 5, 6: Fauvel, 1932, p. 57.

Body large. On the dorsum a triangular brownish area indicates the junction of each segment. Caruncle extending to the 5th body segment. Four large eyes.

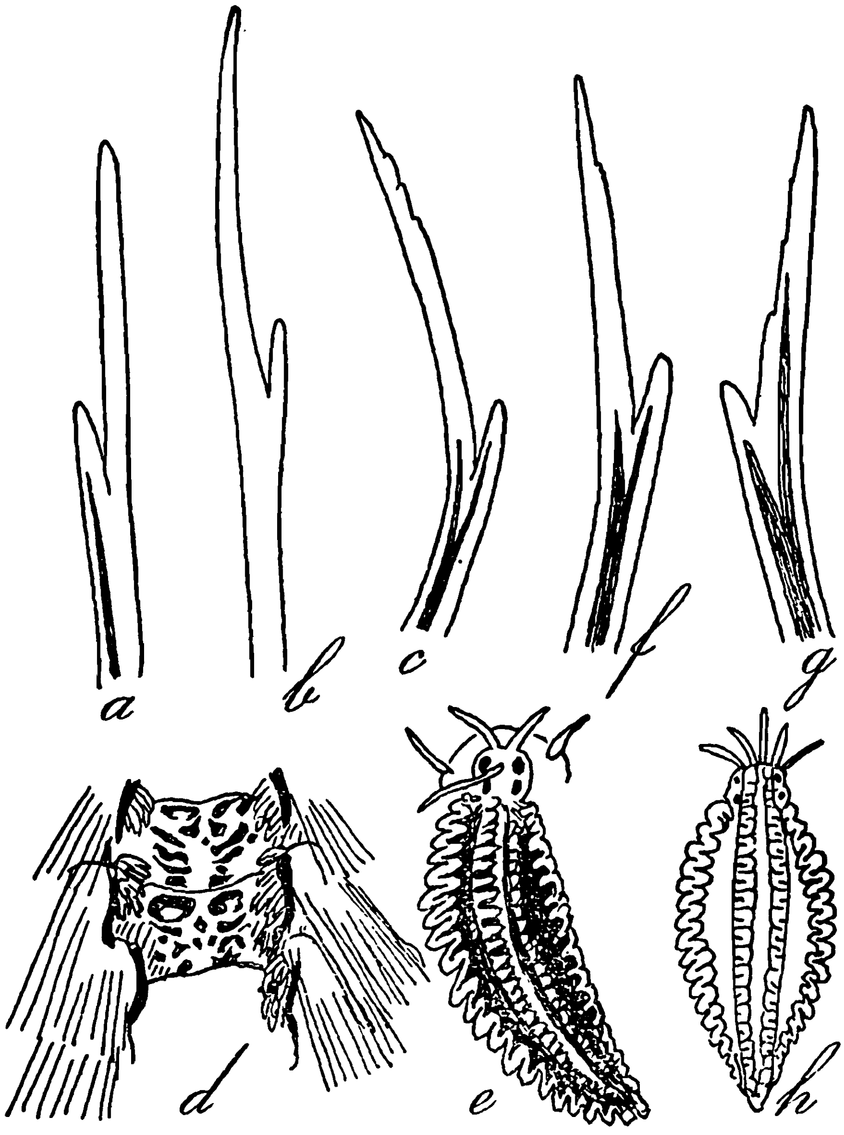


Fig. 47.—*Notopygos gigas* Horst: *a*, dorsal bristle ×230; *b*, ventral bristle ×80; *c*, dorsal bristle of first segment ×230 (after Horst). *N. hispidus* Potts: *d*, two middle segments; *e*, head and caruncle; *f*, dorsal seta from 6th segment (unidentate) ×250; *g*, dorsal seta from 3rd segment (triserrate) ×250. *N. variabilis* Potts: *h*, head and caruncle (after Potts).

Bristles very long, stiff and erect. On the first setigerous segments only, dorsal and ventral setae serrated; next, ventral setae with 2—3 serrations. Dorsal setae smooth. Anus dorsal, on the 20th—21st segment.

Length: 20–40 mm. by 5–10 mm., setae included. The long straight, stiff, alabaster bristles give it a spinous caterpillar appearance.

Occurrence: Andaman Islands and Laccadive Sea.

Distribution: Pacific Ocean, Hawaiian Islands, Philippine Islands; Indian Ocean, Andaman Islands and Laccadive Sea.

77. Notopygos hispidus Potts. (Fig. 47, *d–g*).

Notopygos hispidus, Potts, 1909, p. 359, pl. XLV, figs. 6, 7, pl. XLVI, figs. 3–5 : Fauvel, 1917, p. 192 ; 1919, p. 350 ; 1922, p. 493; 1932, p. 58.

? *Notopygos labiatus*, Benham, 1915, p. 205.

Body elongate. On the dorsum an irregular chequered purple pattern. Caruncle extending to the 5th setigerous segment. The crest is separated from the wings by a smooth linear pigmented area on each side. The lax folds of the wings and crest often come into contact and obscure the area: this is characteristic of the species. Four black, large eyes, sometimes almost contiguous. Dorsal setae not serrated; ventral setae serrated in the first few segments alone. Anus dorsal on the 21st segment.

Length: 24 mm. by 10 mm., setae included.

Occurrence: Nankauri Harbour, Nicobar Islands, amongst coral.

Distribution: Australia; Philippine Islands; Indian Ocean, Red Sea.

78. Notopygos variabilis Potts. (Fig. 47, *h*).

Notopygos variabilis, Potts, 1909, p. 360, pl. XLV, fig. 9: Fauvel, 1931, p. 9; 1932, p. 58.

Body fusiform. Dorsum sometimes ornamented with a pattern of orange spots; most specimens almost without pigment. The folded regions of the caruncle are separated on each side by a smooth pigmented area which is always to be seen. Four large eyes. Dorsal setae non-serrated, ventral setae serrated in the first few segments only, or, sometimes, a few in the ventral bundles of the middle segments with a couple of well marked serrations underneath the hooked apex of the longer limb. Anus dorsal, position varying from the 22nd to the 25th segment. Extensive variations.

Length: 30 mm. by 12 mm., setae included.

Occurrence: Andaman Islands.

Distribution: Nankauri Harbour, Nicobar Islands; Andaman Islands; Maldive Archipelago.

Genus EUPHROSYNE Savigny.

Body short, with few segments. Prostomium elongated and bending over the tip of the snout, partly ventral. Two pairs of eyes, one dorsal, the other ventral. Caruncle with three longitudinal, parallel lobes. A median tentacle and two small lateral ones. Two dorsal cirri on each side. A transverse row of several branchial tufts on each segment. Two anal cirri. Bifurcate setae.

Key to species of Euphrosyne.

Tips of branchial divisions tapering .. .. *myrtosa* Savigny, p. 101.

Tips of branchial divisions expanded .. .. *foliosa* Milne-Edwards, p. 102.

79. Euphrosyne myrtosa Savigny. (Fig. 48, *k—n*)

Euphrosyne myrtosa, Savigny, 1820, p. 64, pl. II, fig. 2: Gravier, 1901, p. 254, pl. X, figs. 147—149: Augener, 1916, p. 95: Fauvel, 1923a, p. 139, fig. 49, *k—n;* 1930a, p. 11, fig. 1; 1932, p. 59.

Euphrosyne ceylonica, Michaelsen, 1892, p. 2, pl. I, figs. 1—4.

Body oval, 36—43 segments. Median tentacles blunt, with a broad base. Lateral tentacles very small. 6—8 branchial tufts in each transverse row, with terminal divisions blunt or tapering, *not enlarged.* Transverse rows of dorsal furcate setae of two kinds: (1) with unequal smooth limbs, and (2) serrated "ringent" bristles. Ventral setae with straight, smooth unequal limbs.

Length: 10—20 mm. by 5 mm.

Colour: In life bright pink or red.

Occurrence: Ceylon, Pamban, Krusadai Island, Sandy Point, among rocks.

Distribution: Pacific Ocean, Malay Archipelago; Indian Ocean, Red Sea; South Atlantic Ocean; Adriatic Sea.

80. Euphrosyne foliosa Audouin and Milne-Edwards (Fig. 48, *a–h*).

Euphrosyne foliosa, Fauvel, 1919, p. 350, fig. 1; 1923a, p. 136, fig. 49, *a–g*; 1932, p. 59.

Euphrosyne laureata, Horst, 1912, p. 11, pl. VI, fig. 10: Pruvot, 1930, p. 25, fig. 2.

Body oval, 30–36 segments. Median tentacle thick, cylindrical. Lateral tentacles very slender and shorter. 7–9 branchial tufts in each transverse row, with terminal divisions more or less expanded and hastate. Transverse

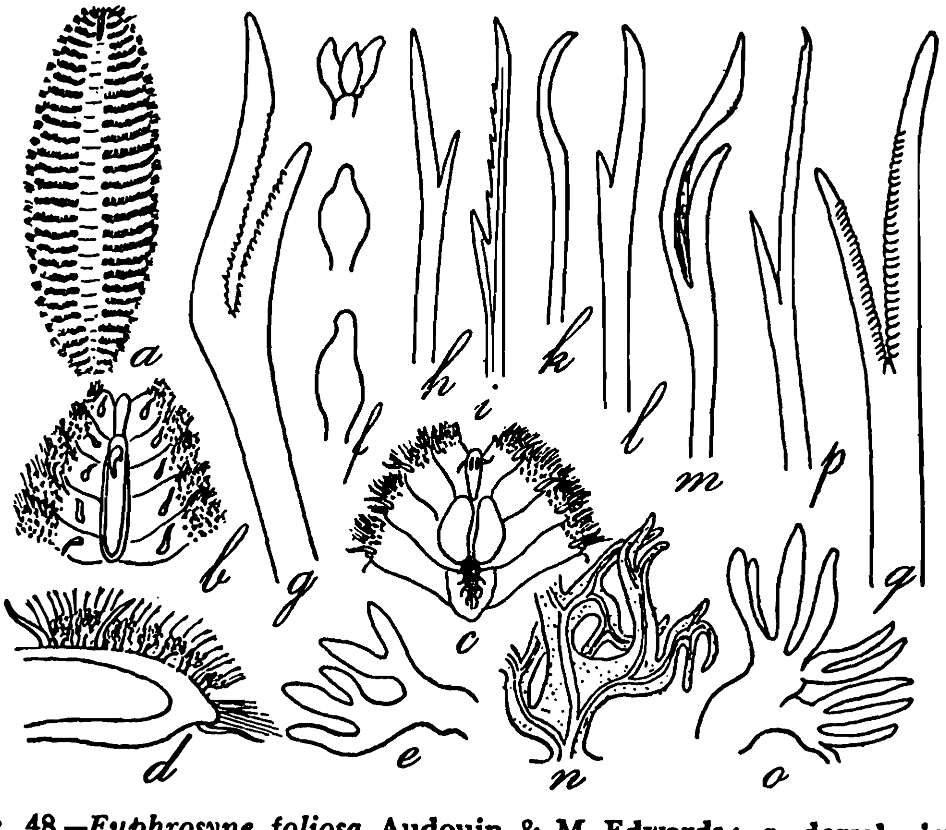


Fig. 48.—*Euphrosyne foliosa* Audouin & M.-Edwards: *a*, dorsal view, enlarged; *b*, head; *c*, anterior part, ventral side; *d*, foot; *e*, *f*, tips of the gills; *g*, ringent bristle ×233; *h*, ventral bristle ×117 & *E. myrtosa* Savigny: *k*, falcigerous bristle; *l*, furcate bristle; *m*, ringent bristle; *n*, gills' tips (after Gravier); *i*, *E. intermedia* Saint-Joseph epitocous stage of *E. foliosa*. *o*, *p*, *q*, branchiæ and setae of *E. armadillo* (not from India).

rows of furcate dorsal setae of two kinds: (1) with unequal smooth limbs, and (2) serrated "ringent" bristles. Ventral setae with smooth, unequal limbs.

Length: 10–30 mm. by 10 mm.

Colour: In life orange red, cinnabar or red-brick.

Occurrence: Nicobar Islands, Nankauri Harbour, Camorta Island, coral reef; Ceylon, Pamban.

Distribution: Malay Archipelago; Indian Ocean, Bay of Bengal, Persian Gulf, Red Sea; Atlantic Ocean, Mediterranean Sea.

Family HESIONIDAE Grube.

Head with two pairs of eyes, two or three tentacles, and generally two biarticulate palps. Proboscis cylindrical, protrusible, armed or unarmed. Anterior segments (1—4) distinct, or more or less fused; each carrying two pairs of tentacular cirri. Other segments bearing uni- or bi-ramous parapodia, the dorsal ramus being often reduced to dorsal cirrus and acicula. Dorsal bristles, when present, simple. Ventral setae generally compound.

Key to the genera.

1. Two tentacles. Palps absent	*Hesione* Savigny, p. 103.
Three tentacles. Palps present	2
2. Two pairs of tentacular cirri, setae simple	*Ancistrosyllis* McIntosh, p. 110.
More than two pairs of tentacular cirri ..	3
3. Six pairs of tentacular cirri. Feet biramous. Proboscis unarmed ..	*Podarke* Ehlers, p. 108.
Eight pairs of tentacular cirri. Body short, cylindrical	4
4. Dorsal setae present	*Leocrates* Kinberg, p. 105.
Dorsal setae absent ..	*Leocratides* Ehlers, p. 107.

Genus HESIONE Savigny.

Body short, cylindrical. Prostomium bilobed. Four eyes. Two very small tentacles. Palps absent. Proboscis unarmed. Eight pairs of tentacular cirri (4 pairs on each side) Parapodia uniramous. Dorsal cirri long, articulate. Setae compound, sickle shaped.

Key to the species of Hesione.

1. Dorsum generally spotted or chequered with brown rounded or elongate dots	*pantherina* Risso, p. 104.
On each dorsal segment a transverse row of brown broad spots	*genetta* Grube, p. 105.
Body pale yellow, numerous narrow longitudinal brown stripes segmentally broken.	*intertexta* Grube, p. 105.

81. Hesione pantherina Risso. (Fig. 49).

Hesione pantherina, Fauvel, 1923a, p. 233, fig. 87, (Synonymy); 1932, p. 60.

Hesione ehlersi, Gravier, 1900, p. 175, pl. IX, figs. 14-15.

Hesione splendida, Augener, 1913, p. 187; Pruvot, 1930, p. 27.

Hesione ceylonica Grube, Willey, 1905, p. 266.

Hesione eugeniae, Kinberg, 1857, p. 57, pl. XXIII, fig. 8.

Body very slightly tapering posteriorly. Segments few (about 16 setigerous), distinct only on the sides. Proboscis smooth, with a larger circular opening and a dorsal conical fleshy papilla near the base. Dorsal cirri long,

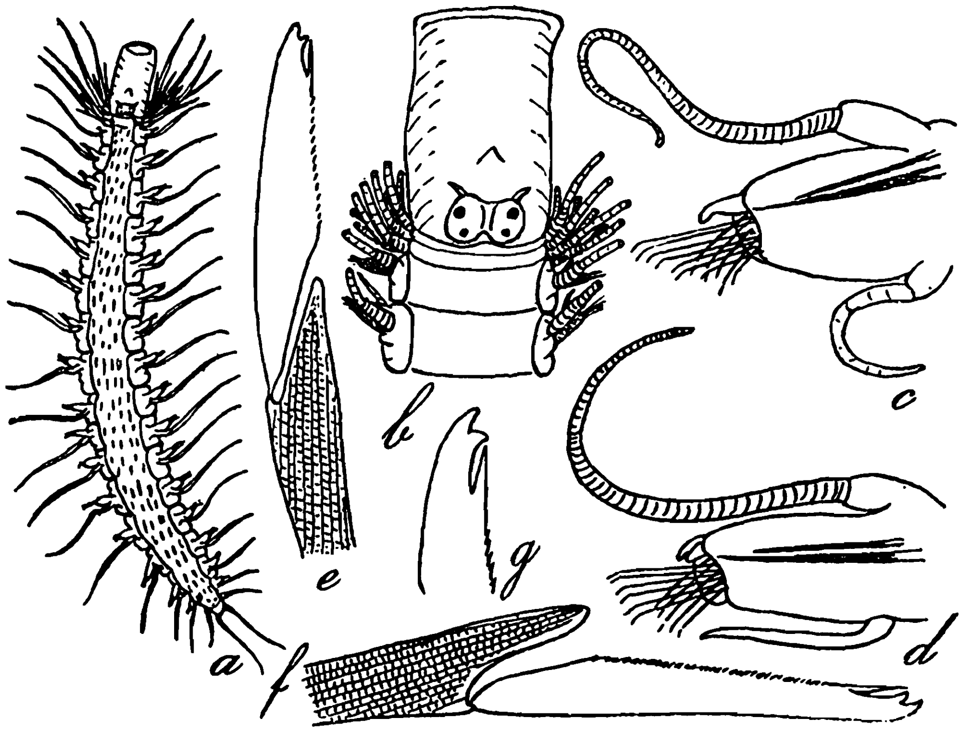


Fig. 49.—*Hesione pantherina* Risso: *a,* natural size; *b,* head and proboscis ×8; *c, d,* two feet from one specimen, enlarged; *e, f,* compound setae with short and long end-piece ×311; *g,* tip of a bristle ×350.

with many short articles, borne on a large cirrophore. Ventral ramus large, cylindrical, hollow, with black spines and ending in two small retractile conical lobes. Ventral setae heterogomph, with a long sickle-shaped terminal piece, bidentate at the apex, with a sub-apical spine very variable in length.

Length: 30—60 mm. by 5—8 mm.

Colour: Very variable, generally spotted or chequered, with brown rounded or elongate dots, often obsolete, or wanting in spirit.

Occurrence: Banka Strait; Nankauri Harbour, Nicobar Islands; Andaman Islands; Chilka Lake, Orissa Coast; Krusadai Island; Rameswaram Island; Ceylon; Arabian Sea.

Distribution: Pacific, Indian and Atlantic Oceans.

82. Hesione genetta Grube.

Hesione genetta, Grube, 1878, p. 102: Willey, 1905, p. 267: Fauvel, 1919, p. 370; 1923, p. 15; 1943, p. 9.

On each dorsal segment a transverse row of about 6—7 broad brown spots, the median one larger than the others. Very possibly this is a mere colour variety of *H. pantherina* (Risso).

Occurrence: Ceylon, Chilwa Paar.

Distribution: Pacific Ocean, California, Samoa, Gambier Islands, Philippine Islands; Indian Ocean, Ceylon, Madagascar.

83. Hesione intertexta Grube.

Hesione intertexta, Grube, 1878, p. 102, pl. VI, fig. 5: Monro, 1926, p. 311; 1937, p. 270: Pruvot, 1930, p. 29.

Body pale yellow, dorsum with numerous, segmentally broken, narrow longitudinal stripes and a pair of brown spots on each intersegmental line.

Very likely a mere colour variety of the widespread *H. pantherina* (Risso).

Length: 40 mm. by 5 mm.

Occurrence: Gulf of Mannar; South Arabian Sea.

Distribution: New Caledonia; Philippine Islands; Australia; Indian Ocean.

Genus LEOCRATES Kinberg.

Body short, cylindrical, segments few. Prostomium bilobed. Four eyes. Three tentacles. Two biarticulate palps. Proboscis with a chitinous jaw in the mid-dorsal and mid-ventral lines. Eight pairs of tentacular cirri. Parapodia biramous. Dorsal ramus small. Dorsal setae simple. Ventral setae compound. Dorsal cirri long, articulate.

Key to the species of Leocrates.

Upper jaw plate composed of two pieces .. .. *diplognathus* Monro, p. 107.

Upper jaw plate single .. *claparedii* (Costa), p. 106.

84. **Leocrates claparedii** (Costa). (Fig. 50, *c—g*).

Leocrates claparedii, Fauvel, 1923a, p. 237, fig. 88; 1930, p. 12; 1932, p. 61; 1939, p. 285.
Leocrates giardi, Gravier, 1900, p. 180, pl. X, figs. 17—19.
?*Leocrates chinensis*, Kinberg, 1857—1910, p. 57, pl. XXIII, fig. 7.
?*Leocrates iris*, Grube, 1878, p. 105.
Leocrates, spec. Gravely, 1927, p. 7, pl. IX, fig. 5.

Median tentacle short, subulate. Lateral tentacles slender, slightly longer than the palps. Facial tubercle

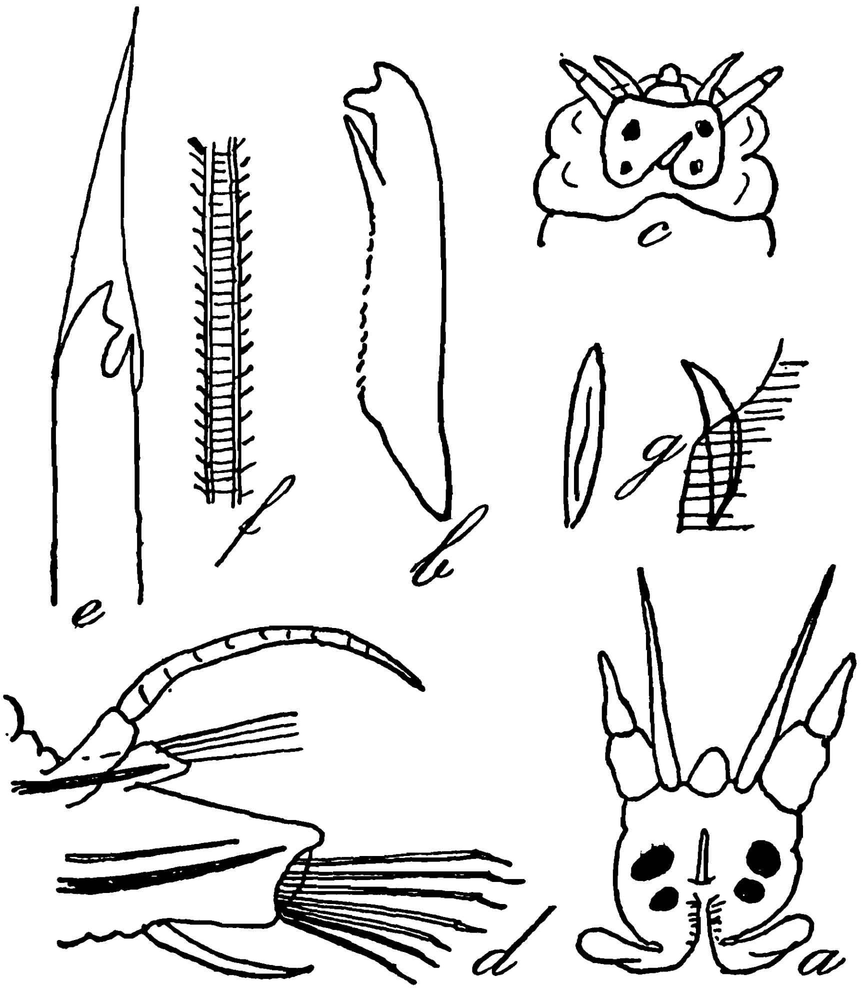


Fig. 50.—*Leocrates diplognathus* Monro: *a*, head, dorsal view ×18; *b*, chaetal blade ×350 (after Monro). *L. claparedii* (Costa) : *c*, prostomium, enlarged; *d*, foot ×15; *e*, lower bristle ×250; *f*, part of dorsal simple bristle ×350; *g*, jaws.

large, blunt, more or less acorn-like. Upper jaw-plate single, hooked. Dorsal setae capillary, spinous. Ventral setae with a bidentate sickle-shaped terminal piece.

Length: 20—45 mm. by 4 mm.

Colour: Flesh-coloured in life, discoloured in spirit.

Occurrence: Singapore; Andaman Islands; Nankauri Harbour; Bay of Bengal; Ceylon; Gulf of Mannar.

Distribution: Japan; Indo-China; Indian Ocean, Persian Gulf, Red Sea; Mediterranean Sea.

85. **Leocrates diplognathus** Monro. (Fig. 50, *a—b*)

Leocrates diplognathus, Monro, 1926, p. 313: Fauvel, 1932, p. 62; 1939, p. 285.

Paired tentacles about twice as long as the palps, which are furnished with very stout basal articles. Facial tubercle more or less conical and not very prominent. The anterior and larger pair of eyes, which are not clearly marked out, arise on a level with the unpaired tentacle. Behind the posterior median furrow the prostomium curves back in a remarkable wing-like pair of folds (everted nuchal organs). The upper jaw-plate is composed of two pieces set together in the form of a bifid fan. Dorsal setae with well marked spines. In the ventral setae the teeth of the blade are large and widely separated. The lamelliform guard approaches the sub-apical tooth.

Length: 20—30 mm.

Colour: Dorsum a dark chestnut-brown traversed by intersegmental bands of white.

Occurrence: Mergui Archipelago, 65 fms.

Distribution: Macclesfield Bank; China Sea; Annam; Mergui Archipelago.

Genus LEOCRATIDES Ehlers.

Differs from *Leocrates* in the absence of setae in the dorsal ramus, which is reduced to an aciculum at the base of the dorsal cirrus.

86. **Leocratides ehlersi** (Horst) (Fig. 51, *a—c*)

Leocratides ehlersi, Horst, 1924, p. 194, pl. XXXVI, figs. 10—12: Fauvel, 1932, p. 62.

Prostomium heart-shaped. Two pairs of eyes, the anterior larger. Median tentacle tapering. The frontal tubercle bears, on each side between the base of the palps and tentacular cirri, a cushion-shaped appendage. The dorsal jaw is double, each half consists of a long shaft with an expanded anterior plate. Ventral jaw simple, conical.

Parapodia uniramous, only a couple of minute acicula in the base of the dorsal cirrus. Terminal blade of the ventral setae short, hook-shaped, slender, with only a single tooth and lacking the secondary process beneath the bifid tip. Differs from *L. filamentosus* Ehlers only in having a double dorsal jaw.

Length: 25 mm.

Colour: A brownish violet subneural band.
Occurrence: Andaman Sea.
Distribution: Salhe Bay, Sumbawa; Andaman Sea.

Genus PODARKE Ehlers.

Prostomium quadrangular, with three tentacles on its anterior margin. Two biarticulate palps. Four eyes. Proboscis unarmed, with or without filiform papillae.

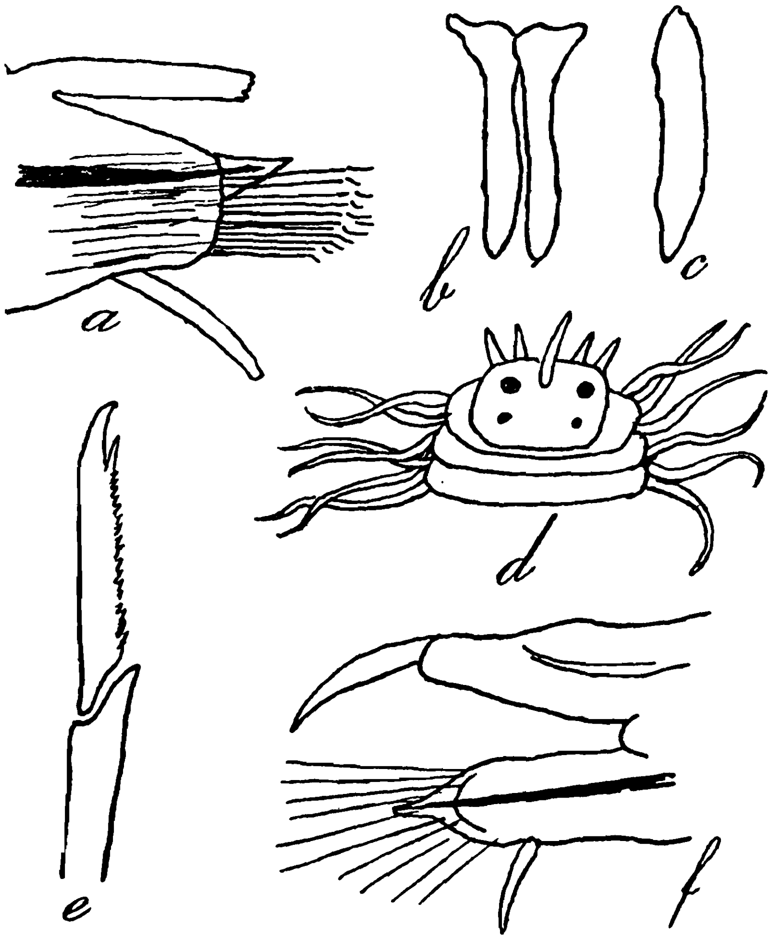


Fig. 51.—*Leocratides ehlersi* (Horst): *a*, foot ×30; *b*, dorsal jaws ×30; *c*, ventral jaw ×30 (after Horst). *Podarke latifrons* (Grube): *d*, head, enlarged; *e*, short ventral bristle; *f*, foot from mid-body.

Six pairs of tentacular cirri. Parapodia sub-biramous. Dorsal cirri long. Dorsal setae few, often bifurcated. Ventral setae compound.

Key to the species of Podarke.

Dorsal cirri without a big cirrophore. Several furcate dorsal setae	*angustifrons* (Grube), p. 109.
Dorsal cirri with a big cirrophore. 1 or 2 dorsal furcate setae	*latifrons* (Grube), p. 110.

87. Podarke angustifrons (Grube) (Fig. 52, *a–d*)

Podarke angustifrons, Fauvel, 1932, p. 63; 1939, p. 286.

Podarke didymocera Schmarda, Augener, 1934, p. 226.

Irma angustifrons, Grube, 1878, p. 108, pl. IV, fig. 7, pl. XV, fig. 12.

Irma limicola, Willey, 1905, p. 267, pl. III, figs. 74–76.

Prostomium rectangular. Small palps. Median tentacle small, fusiform. Proboscis with numerous long cilia on the anterior margin. Long smooth, or faintly ringed dorsal cirri. 6–7 simple dorsal setae and, some-

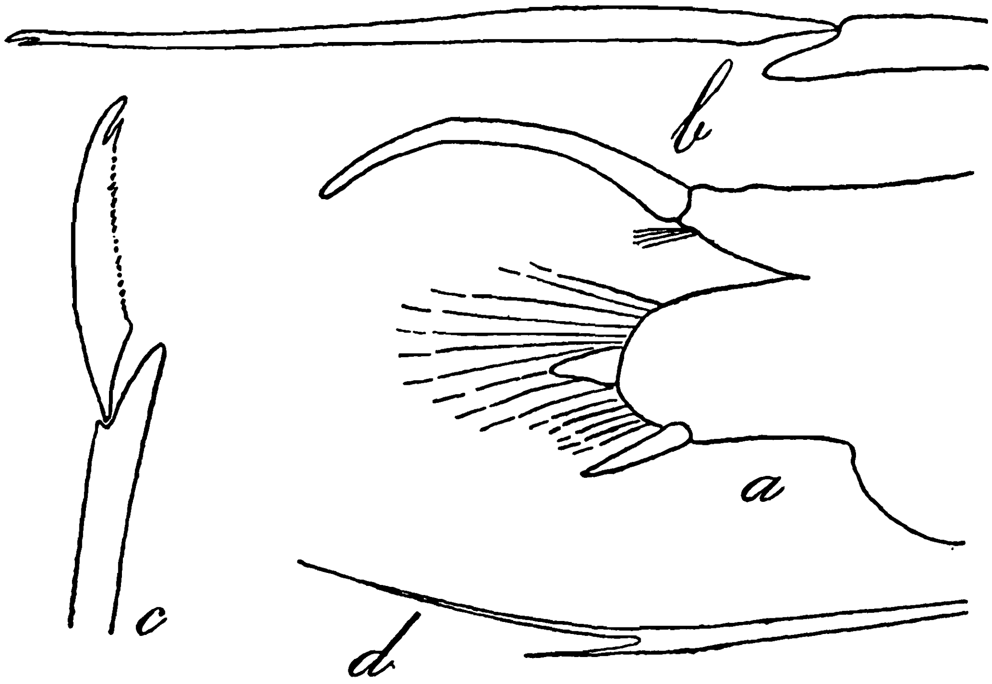


Fig. 52.—*Podarke angustifrons* (Grube): *a*, foot ×35; *b*, long compound bristle ×380; *c*, short compound bristle ×380; *d*, forked bristle ×520 (from Fauvel, 1932).

times, a furcate seta with long unequal limbs. Ventral ramus stout, with a conical lobe and a shorter rounded one. Ventral cirrus subulate, short. Upper ventral setae with a long, slender, terminal piece, hook-like with a sub-apical spine. Lower setae with a gradually shorter and broader terminal piece. Furcate setae.

Length: 16 mm.

Colour: In life, brown with white rings.

Occurrence: Camorta Island, Nicobar Islands; India, Pamban Island.

Distribution: Philippine Islands; Indo-China; India; Indian Ocean, Persian Gulf, Red Sea; Australia (?); New Zealand (?).

88. **Podarke latifrons** (Grube). (Fig. 51, *d–f*).

Podarke latifrons, Fauvel, 1939, p. 288.

Irma latifrons, Grube, 1878, p. 109, pl. VI, fig. 6, pl. XV, fig. 11: Monro, 1926, p. 315.

Prostomium broader than long. Palps small. Median tentacle small, fusiform. Proboscis with long cilia on the anterior margin. Long dorsal cirri, smooth or faintly ringed, *borne on a big cirrophore.* A single dorsal seta, simple or furcate, often altogether absent on a number of feet. Ventral ramus stout, with a conial lobe and a shorter rounded one. Ventral cirrus short, subulate. Upper ventral setae with a longer, slender terminal piece ending in a hook with a sub-apical spine. Lower setae with a shorter and broader terminal piece. Both kinds of setae more distinct than in *P. angustifrons.* Furcate setae scarce.

Length: 77 mm. by 4 mm.

Occurrence: Singapore.

Distribution: Philippine Islands; Hongkong; Annam; China Sea; Singapore; Australia.

Genus ANCISTROSYLLIS McIntosh.

Body elongated. Prostomium small. Eyes small or absent. Three tentacles. Large ovoid palps with very small palpostyles. Proboscis unarmed. Two pairs of tentacular cirri. Dorsal ramus reduced to a cirrus, a slender enclosed aciculum and stout spine straight or curved. Ventral ramus short, with a bundle of simple capillary setae and, sometimes, a few furcate setae. A long ventral cirrus.

Key to the species of Ancistrosyllis.

Body rounded, stiff. Head very small, retracted into the first segments. Dorsal spines straight	*rigida* Fauvel, p. 110.
Body flat, soft. A distinct neck about the fourth segment. Head larger. Dorsal spines curved	*constricta* Southern, p. 111.

89. **Ancistrosyllis rigida** Fauvel. (Fig. 53).

Ancistrosyllis rigida, Fauvel, 1919, p. 373, fig. 4; 1923b, p. 16, fig. 3; 1932, p. 64; 1939, p. 288: Augener, 1927c, p. 134; 1927, p. 50.

Kynephorus inermis, Ehlers, 1920, p. 27, pl. III, figs. 1–9.

Body stiff, rounded dorsally. Head very small, retracted into the first segments. Palps ovoid, with a very short palpostyle and a small papilla. Median tentacle inserted between the palps; lateral tentacles very small, inserted on the palpophores. Four very small eyes. Parapodia borne on lateral square cushions. Dorsal and

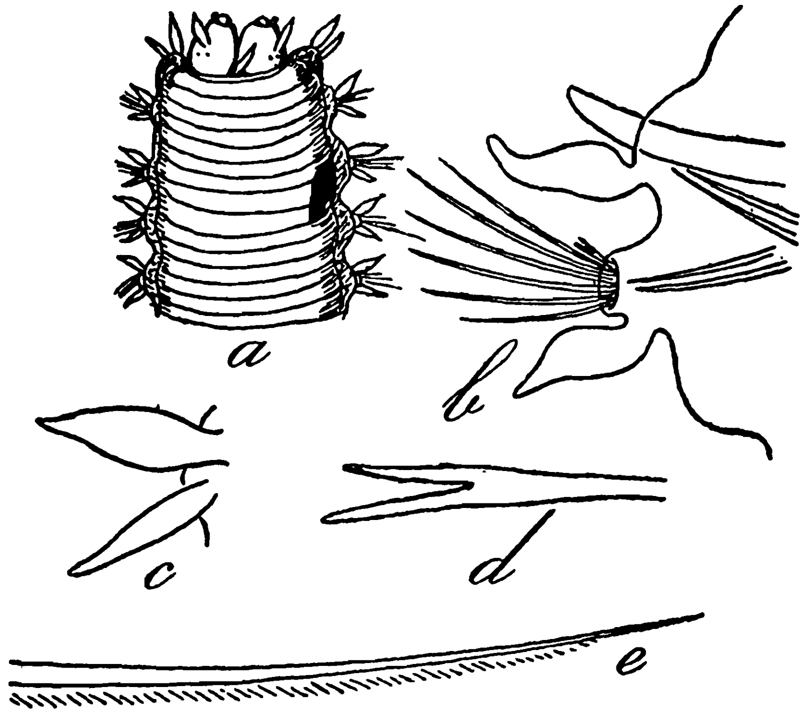


Fig. 53.—*Ancistrosyllis rigida* Fauvel: *a*, anterior part ×15; *b*, foot ×100; *c*, tentacular cirri ×100; *d*, forked bristle ×700; *e*, capillary bristle ×400.

ventral cirri fusiform. Dorsal ramus reduced to 1—3 slender enclosed acicula and a large blunt, faintly curved or straight spine from the 15th—20th setigerous segment backwards. Ventral setae capillary, winged, and 1—2 furcate setae. Two anal cirri. General appearance wiry.

Length: 10—35 mm. by 0.5—1.5 mm.

Colour: In spirit, yellowish brown with lateral pads whitish or reddish.

Occurrence: Andaman Islands; Madras and Orissa coasts.

Distribution: Gambier Islands; Indo-China; Malayan Sea; Indian Ocean, Red Sea; Atlantic Ocean, Curaça.

90. Ancistrosyllis constricta Southern. (Fig. 54)

Ancistrosyllis constricta, Southern, 1921, p. 573, pl. XIX, fig. 1. Fauvel, 1930, p. 64.

Greatest width at the anterior end, a distinct neck at the 4th setigerous segment, after which the body becomes flat. Peristomium and three anterior segments longer than the succeeding ones. Flattened palps with a small palpostyle. Median tentacle twice as long as the laterals, which project a little beyond the palps. Dorsal cirri on the first setigerous segment very long and tapering. An

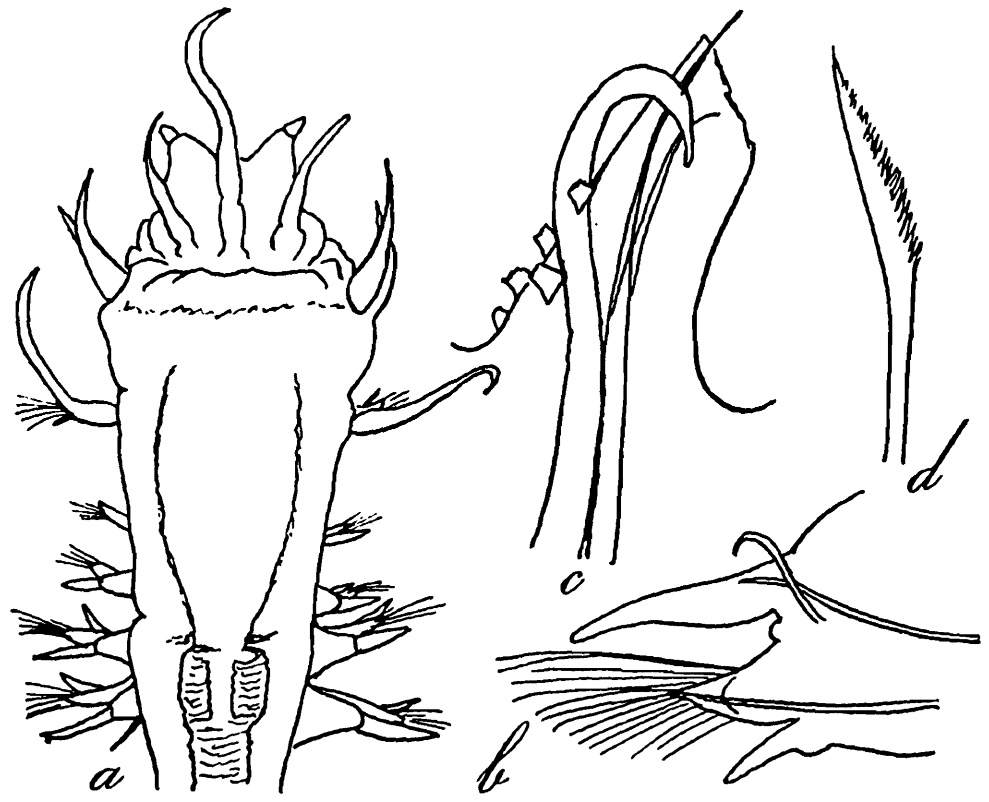


Fig. 54.—*Ancistrasyllis constricta* Southern: *a*, anterior end, dorsal view ×31; *b*, 40th right foot ×78; *c*, part of dorsal lobe of 80th right foot, posterior view ×257; *d*, anterior dorsal seta from 1st foot ×436 (after Southern).

enclosed dorsal slender aciculum and, between the 30th and 40th feet, a stout sickle-shaped seta. Minute papillae on the base of the dorsal cirrus. Ventral setae capillary, smooth or faintly serrated and, in the anterior feet, shorter and coarsely serrated setae.

Length: 19 mm. 155 segments.

Occurrence: Chilka Lake; Vizagapatam. On muddy or sandy bottom.

Incertae Sedis.

Genus TALEHSAPIA Fauvel.

The characters of the genus are those of the only species known.

91. Talehsapia annandalei Fauvel. (Fig. 55, *a–h*)

Talehsapia annandalei, Fauvel, 1932, p. 251, pl. IX, figs. 13–20; *non* Fauvel, 1935, p. 333, fig. 6.

Body filiform, cylindrical; teguments smooth and shining. First five segments slightly swollen. The prostomium is a blunt cone, destitute of eyes, tentacles and processes of any kind. Mouth broad. Proboscis soft, cylindrical, transparent, without any papillae. Pharynx extending to the middle of the 5th setigerous segment, ventricle with a pair of horny jaws, shaped, on each side, as a brown, sharp hook with an accessory paragnath. The

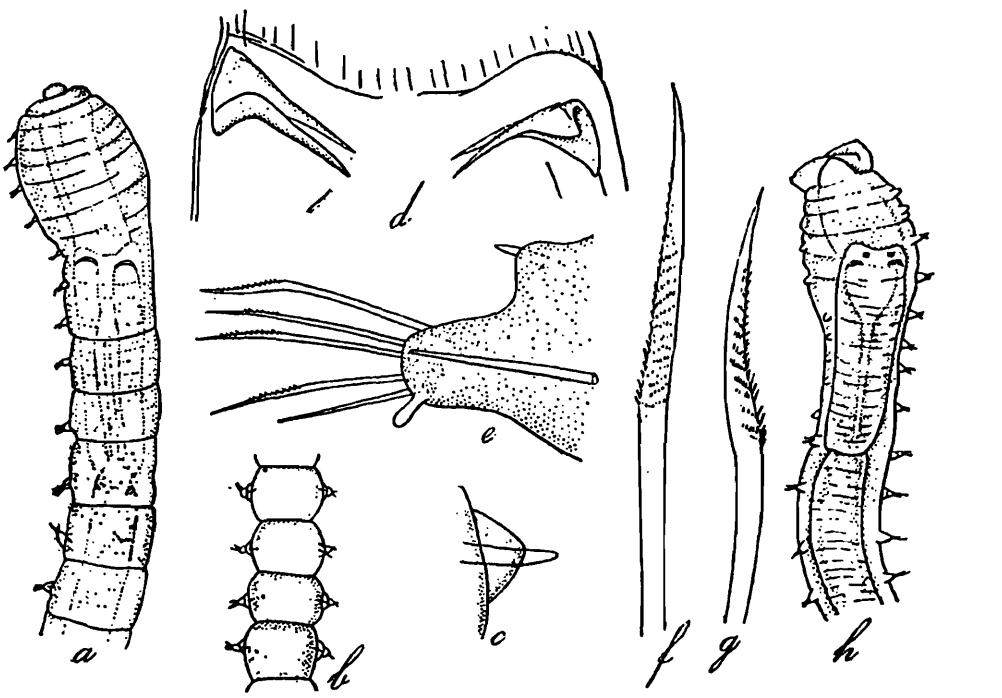


Fig. 55.—*Talehsapia annandalei* Fauvel: *a*, anterior end, compressed, showing the jaws ×6; *b*, segments of posterior end ×6; *c*, dorsal ramus and stout acicular bristle ×54; *d*, jaws, dorsal view ×43; *e*, foot ×59; *f*, *g*, hispid setae ×270; *h*, anterior end, proboscis partly extruded, pharynx and jaws seen through the body walls of the cleared specimen ×6.

first five segments are slightly swollen. The feet consist of a blunt cylindrical setigerous lobe with a very small ventral cirrus. There is no dorsal cirrus. A stout aciculum, often reddish at the tip, does not protrude outwards. The setae are all simple, straight or slightly curved, and minutely hispid. In front view they look faintly bipectinate. Above the setigerous lobe a stout acicular bristle arises from a broad blunt cone, sometimes accompanied with a very slender, filiform capillary seta. Two short anal cirri (?).

Length: 30—32 mm. by 1 mm. 54—80 segments, the last ones moniliform.

Colour: In spirit, yellowish-white, with broad, rounded, purple spots on the sides, encircling the feet.

Occurrence: Taleh-Sap, Gulf of Siam (brackish water?). Only two specimens known.

Remarks: At first, I wondered whether this species were not an aberrant Eunicid; later, a comparison with *Loandalia* Monro and *Ancistrosyllis* McIntosh suggested its attribution to the *Hesionidae* as more likely. The fragments of a worm from Annam which I attributed to *Talehsapia* (1935, p. 333) belong to a *Loandalia* spec. and not to the species from Taleh-Sap.

Family PHYLLODOCIDAE Grube.

Body generally long and slender; segments very numerous. Prostomium conical, oval or heart-shaped. Two eyes. Four or five tentacles. Proboscis unarmed. Segments 1—3 modified, bearing tentacular cirri. Feet uniramous. (Exceptionally biramous.) Dorsal and ventral cirri foliaceous. Setae compound.

Key to Subfamilies and genera.

1. Body long, slender. Dorsal and ventral cirri large, foliaceous	*PHYLLODOCINAE*, 4; p. 115.
Body short, small; pelagic	2
2. Feet biramous. Four tentacles, no palps. .*LACYDONINAE*	*Paralacydonia* Fauvel, p. 128
Feet uniramous. 2—3 pairs of tentacular cirri. .*LOPADORHYNCHINAE*	3
3. Dorsal and ventral cirri cylindrical ..	*Pelagobia*, Greef, p. 131.
Dorsal and ventral cirri lanceolate	*Lopadorhynchus* Grube, p. 130.
4. Feet biramous. 5 tentacles	*Notophyllum* Oersted. p. 126.
Feet uniramous. Body slender. Cirri large	5
5. Two pairs of tentacular cirri	*Eteone* Savigny, p. 127.
Four pairs of tentacular cirri	6
6. Four tentacles ..	*Phyllodoce* Savigny, p. 115.
Five tentacles ..	*Eulalia* Oersted, p. 122.

Subfamily PHYLLODOCINAE.

Genus PHYLLODOCE Savigny.

Body very long and slender, segments very numerous. Prostomium oval or heart-shaped. *Four tentacles.* Proboscis long and papillose. Four pairs of tentacular cirri borne on three more or less distinct segments. Parapodia uniramous. Dorsal and ventral cirri large, foliaceous. Setae compound.

Key to the species of Phyllodoce.

1. Prostomium rounded	*castanea* (Marenzeller), p. 115.
Prostomium heart-shaped	2
2. Tentacles and tentacular cirri ovoid	*quadraticeps* Grube, p. 116.
Tentacles and tentacular cirri subulate	3
3. Numerous irregular rows of small papillae at the base of the proboscis ..	4
Papillae on the base of the proboscis arranged in 6 longitudinal rows on each side	6
4. Dorsal cirri sub-rhomboidal	*malmgreni* Gravier, p. 117.
Dorsal cirri lanceolate	5
5. Dorsal cirri short	*gracilis* Kinberg, p. 117.
Dorsal cirri twice as long as broad	*fristedti* Bergstrom, p. 118.
6. Dorsal cirri rounded	*dissotyla* Willey, p. 119.
Dorsal cirri lanceolate	*tenuissima* Grube, p. 121.
Dorsal cirri lanceolate falcate	*madeirensis* Langerhans, p. 120.

92. Phyllodoce castanea (Marenzeller). (Fig. 56, *a—c*).

Phyllodoce castanea, Fauvel, 1919, p. 359; 1932, p. 68.
Carobia castanea, Marenzeller, 1879, p. 127, pl. III, fig. 2; Willey, 1905, p. 262; Izuka, 1912, p. 199, pl. XVI, fig. 3.
Genetyllis castanea, Bergstrom, 1914, p. 158, fig. 53.

Prostomium oval or rounded. Tentacular cirri more or less flattened. Dorsal cirri very large, cordate, those on anterior feet broader, more rounded than the posterior ones. Ventral cirri reniform.

Length: 10—20 mm.

Colour: Deep red, rusty or chestnut brown in spirit.

Occurrence: Tuticorin pearl bank; Ceylon.

Distribution: California; Japan; Australia; New Zealand; Ceylon; Persian Gulf; Red Sea.

93. Phyllodoce quadraticeps Grube. (Fig. 56, *f–j*).

Phyllodoce quadraticeps, Grube, 1878, p. 98, pl. VI, fig. 2: Gravier, 1900, p. 198, pl. X, figs. 22–24: Fauvel, 1930, p. 511, 1932, p. 68.

Sphaerodoce quadraticeps, Bergström, 1914, p. 50.

Body long, slender. Prostomium nearly square, with a small posterior notch and a very minute occipital papilla. Short knob-like tentacles. Tentacular cirri of the three anterior pairs short, swollen, ovoid; those of the fourth pair subulate. Dorsal cirri thick, rounded, rather small.

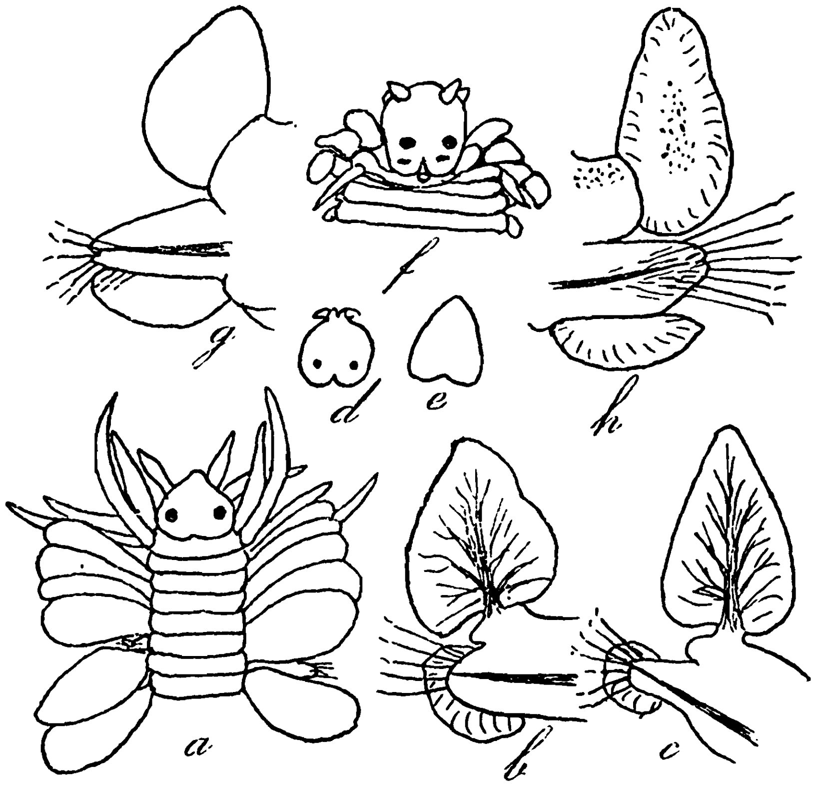


Fig. 56.—*Phyllodoce castanea* (Marenzeller): *a*, anterior end (after Izuka); *b*, anterior foot ×40; *c*, hind foot ×31. *Ph.* (?) *zeylanica* Willey: *d*, head, *e*, dorsal cirrus (after Willey). *Ph. quadraticeps* Grube: *f*, anterior end; *g*, hind foot. *Ph. malmgreni* Gravier: *h*, foot (after Gravier).

Length: 200 mm. by 2–3 mm.

Colour: Back dirty yellow; on each segment a broad dark-coloured transverse streak. Thick dorsal cirri pale yellow.

Occurrence: Camorta Island, shore collecting; Sumatra.

Distribution: Pacific Ocean; Korea Sund, New Caledonia, Philippine Islands; Indian Ocean, Bay of Bengal, Red Sea.

94. Phyllodoce malmgreni Gravier. (Fig. 56, *h*).

Phyllodoce malmgreni, Gravier, 1900, p. 207, pl. X, figs. 29–31.
Phyllodoce malmgreni, Fauvel, 1919, p. 360; 1932, p. 68.

Prostomium heart-shaped. Tentacular cirri long, subulate. Papillae of the base of the proboscis more or less conical, scattered in numerous irregular longitudinal rows. Dorsal cirri sub-rectangular or sub-rhomboidal. Body slender.

Length: 40–70 mm.

Colour: Back yellowish, with a dark spot on each segment; "green in life with a double row of black spots."

Occurrence: Vizagapatam.

Distribution: India; Red Sea.

95. Phyllodoce gracilis Kinberg. (Fig. 57).

Phyllodoce gracilis, Kinberg, 1857–1910, p. 55, pl. XXII, fig. 2: Fauvel, 1932, p. 69, fig. 12.

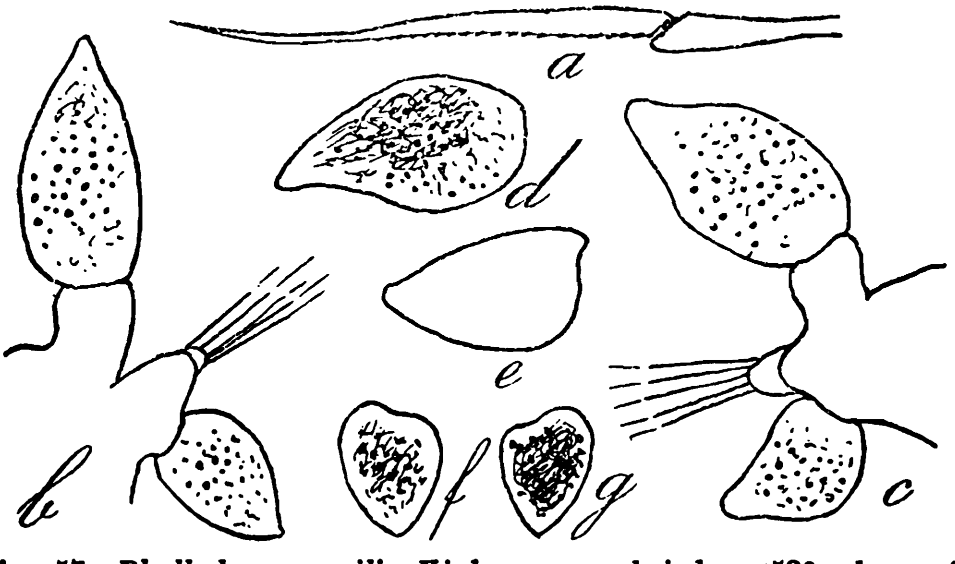


Fig. 57.—*Phyllodoce gracilis* Kinberg: *a*, bristle ×520; *b*, *c*, feet ×65; *d*, *e*, dorsal cirri ×65; *f*, *g*, ventral cirri ×65 (from Fauvel 1932).

Long, slender body. Prostomium heart-shaped. Two large eyes. Tentacular cirri long, subulate. Base of the proboscis covered with numerous scattered small papillae. Dorsal cirri small, oval. Ventral cirri similar, smaller.

Length: 25–30 mm. by 1 mm.

Colour: In spirit, greyish-white, dorsal and ventral cirri thickly dotted with rusty brown spots.

Occurrence: Andaman Islands.

Distribution: Australia (?); Society Islands; Andaman Islands.

96. Phyllodoce fristedti Bergström. (Fig. 58, a—b).

Phyllodoce fristedti, Bergström, 1914, p. 152, fig. 49, pl. III, fig. 1, Augener, 1926, p. 445.

?*Phyllodoce macrolepidota*, Schmarda, 1861, p. 83, pl. XXIX, fig. 229 (*non* Willey 1905).

Body very long and slender. Prostomium heart-shaped, with an occipital papilla. Numerous irregular rows of small papillae on the base of the proboscis. Tentacular cirri subulate, the longer ones reaching to the 6th—7th segment. Average dorsal cirri oval-lanceolate, nearly twice as long as broad. Ventral cirri broad and blunt.

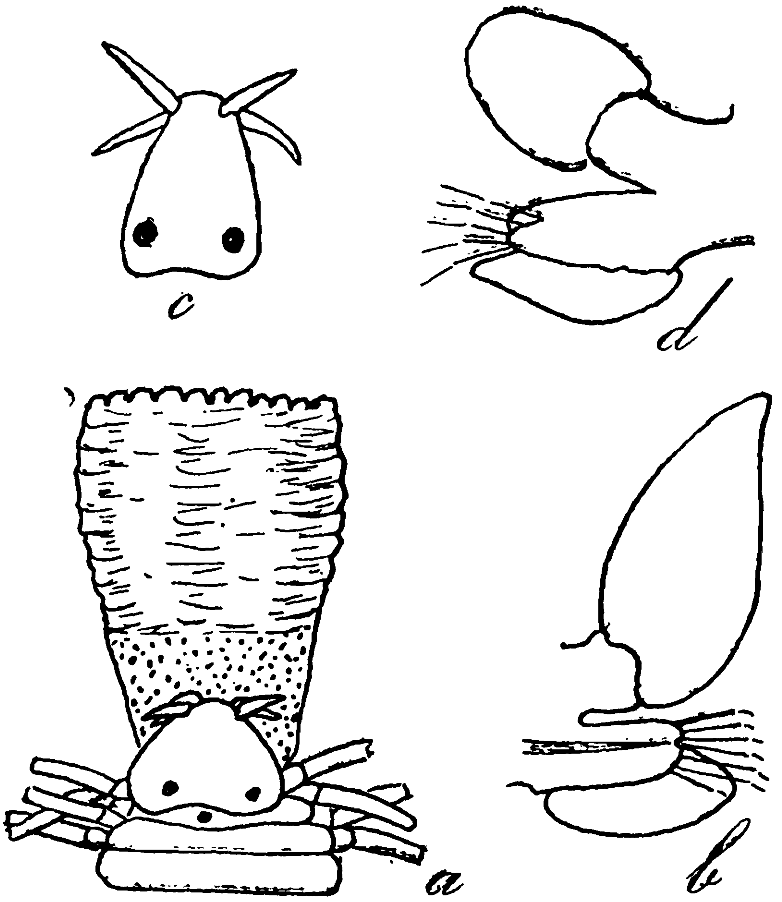


Fig. 58.—*Phyllodoce fristedii* Bergström: *a*, head and proboscis ×4; *b*, foot (after Bergström). *Ph.* (*Anaitides*) *dissotyla* Willey: *c*, head; *d*, foot (after Willey).

Length: 200 mm. by 3 mm.

Colour: In life, body blue, cirri yellow. In spirit, light brown.

Occurrence: Ceylon, Trincomali.

Distribution: Indian Ocean.

Remarks: This species is closely allied to *Ph. laminosa*, differing chiefly by its more narrow and longer dorsal cirri.

Incertae Sedis.

97. **Phyllodoce (?) zeylanica** (Willey). (Fig. 56, *d–e*).

Anaitis zeylanica, Willey, 1905, p. 262, pl. III, figs. 57–60.

Body slender, " head rounded, eyes large, tentacular cirri normal, elongate. Proboscis (dissected) consists of two well-separated portions, a thin walled proximal or adoral portion densely covered with papillae, not serially disposed; a thick walled distal portion with six prominent rows of large sub-triangular papillae, six or seven in a row. Dorsal phyllodes broadly ovate (cordate-lanceolate) as they are in a dozen other species". (Willey.) Shafts of the setae terminating in a triangular apex, fringed at the sides and articulating on one side with a long, flagelliform, strongly serrated appendix. Anal cirri acuminate.

Length: 38 mm. by 2 mm.

Occurrence: South Mannar Island; 8–9 fms.

Remarks: Very likely a *Phyllodoce* or a *Genetyllis,* more or less akin to *Ph. castanea* (?), but not an *Anaitis.*

Subgenus ANAITIDES Czerniavsky.

Prostomium heart-shaped. Papillae on the base of the proboscis arranged in 6 longitudinal rows on each side.

98. **Phyllodoce (Anaitides) dissotyla** (Willey) (Fig. 58, *c–d*)

Phyllodoce (Anaitides) dissotyla, Willey, 1905, p. 263, pl. III, figs. 63–66. Fauvel, 1911, p. 373.

Body long and slender. Prostomium longer than broad, heart-shaped, with a very minute occipital papilla. Two large eyes each with a lens. The antennae do not reach back to the eyes. Four pairs of long tentacular cirri. Proboscis with the adoral portion beset with longitudinal rows of rounded normal papillae; in two of the rows, median dorsal and median ventral, three large triangular papillae placed one behind the other, with normal papillae in front and behind in the same rows: two sets of three on opposite sides of the proboscis. Dorsal cirri rounded, not lanceolate, and strongly pedunculate. The setae are conspicuously heterogomph; their appendices with serrulated edge.

Length: 18–25 mm. by 1 mm.

Occurrence: Gulf of Mannar, 11 fms.

Distribution: India; Persian Gulf.

99. **Phyllodoce (Anaitides) madeirensis Langerhans.** (Fig. 59, *d–h*)

Phyllodoce madeirensis, Langerhans, 1879, p. 307, pl. XVII, fig. 44: Fauvel, 1914, p. 111, pl. VI, figs. 5–13; 1932, p. 70.

Phyllodoce sancti-vincentis, McIntosh, 1885, p. 166.

Phyllodoce sancti-josephi, Gravier, 1900, p. 196, pl. X, figs. 20–21.

? *Phyllodoce foliosopapillata*, Willey, 1905, p. 264, pl. III, figs. 67–69.

Body slender, with a long tapering tail. Prostomium heart-shaped, with an occipital papilla. Proboscis with

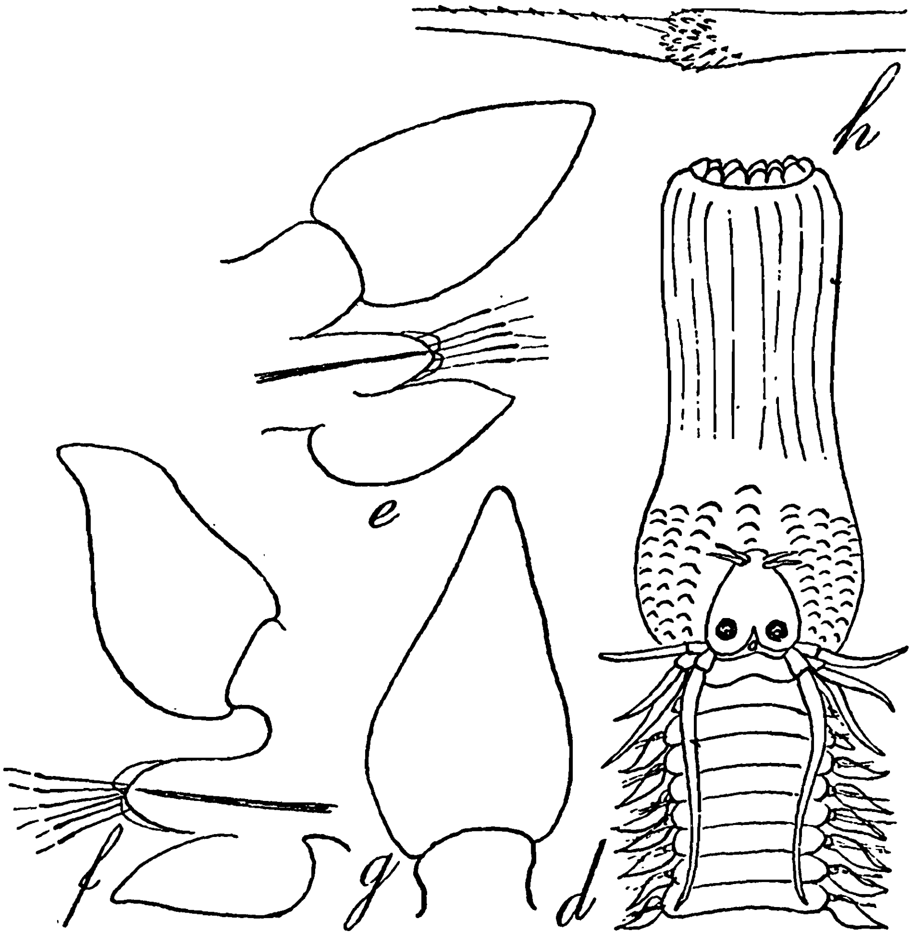


Fig. 59.—*Phyllodoce* (*Anaitides*) *madeirensis* Langerhans: *d*, anterior end and proboscis ×7 (after Rioja); *e*, anterior foot; *f*, foot from mid-body; *g*, dorsal cirrus, enlarged; *h*, bristle.

12 longitudinal rows (6 on each side) of papillae at the base and, sometimes, a dorsal median row of 4–6 papillae. Dorsal cirri oval, lanceolate or sub-rhomboidal, very variable in shape; ventral cirri longer than the foot.

Length: 200–600 mm. by 1–3 mm.

Colour: In spirit, yellowish-white or light brown.

Occurrence: Malacca Straits; Mergui; Andaman Islands; Ceylon; Laccadive Sea.

Distribution: Pacific Ocean, China, Annam, Philippine Islands, Australia, Malay Archipelago; Indian Ocean, Persian Gulf, Red Sea; Atlantic Ocean, Mediterranean Sea.

100. **Phyllodoce (Anaitides) tenuissima** Grube. (Fig 60, *d*)

Phyllodoce tenuissima, Grube, 1878, p. 95: Fauvel, 1932, p. 70: Augener, 1927a, p. 118.

Phyllodoce macrolepidota, Willey (*non* Schmarda), 1905, p. 265, pl. III, figs. 70—71.

Body very long and slender. Prostomium heart-shaped. Two large eyes. A very small occipital papilla. Probos-

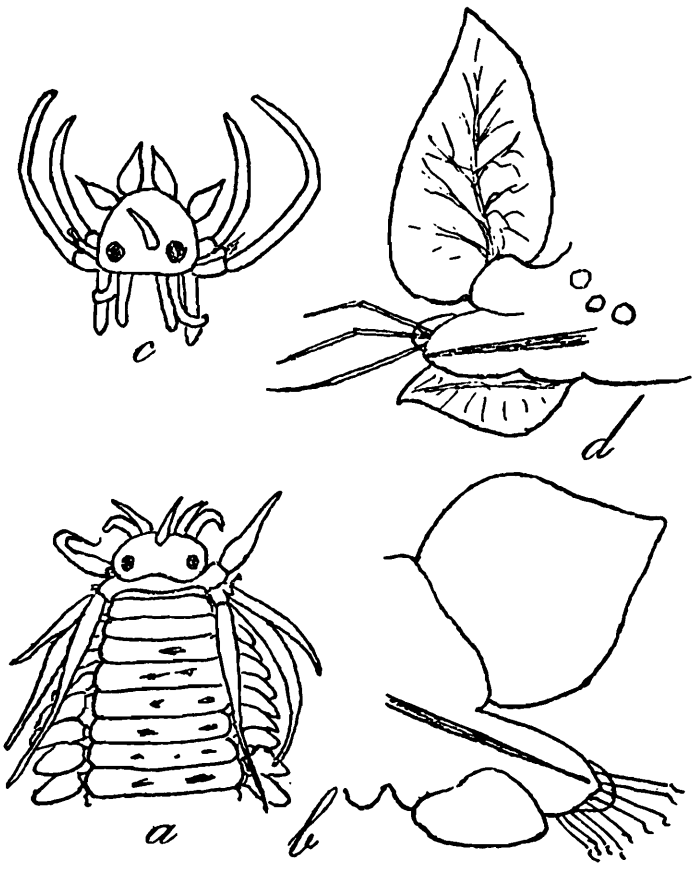


Fig. 60.—*Eulalia albo-picta* Marenzeller: *a*, anterior part ×20; *b*, 55th foot ×56 (after Marenzeller). *Notophyllum splendens* (Schmarda): *c*, head, enlarged (after Willey). *Phyllodoce tenuissima* Grube (=*Ph. macrolepidota* Willey, non-Schmarda): *d*, foot (after Willey).

cis with 12 longitudinal rows of papillae at the base and a dorsal median row of three brown papillae. Dorsal cirri broadly lanceolate or with the apex truncate, sub-quadrangular. Ventral cirri about the length of the foot.

Length: 200 mm. by 3 mm.

Colour: In life, bright green, with red and yellow markings. In spirit, yellowish with transverse dark-blue iridescent streaks.

Occurrence: Nicobar Islands; Ceylon.

Distribution: New Zealand; Australia; Philippine Islands; Nicobar Islands; Ceylon.

Remarks: Perhaps a mere colour variety of *Phyllodoce madeirensis* Langerhans.

Genus EULALIA Oersted.

Body long and slender, segments numerous. Prostomium conical, oval or pyriform. Two eyes. *Five tentacles*. Proboscis long and papillose, rarely smooth. Four pairs of tentacular cirri, borne on three more or less distinct segments. Parapodia uniramous. Setae compound.

Key to the species of Eulalia.

1. Dorsal cirri heart-shaped	2
Dorsal cirri lanceolate	3
2. Proboscis smooth	*sanguinea* Oersted, p. 125.
Proboscis with papillae ..	*albopicta* Marenzeller, p. 123.
3. Ventral cirrus of second tentacular pair flattened, winged ..	*magalhaensis* Kinberg, p. 124.
Ventral cirrus of second tentacular pair not materially flattened, not winged ..	*viridis* (Muller), p. 122.

101. Eulalia viridis (Muller). (Fig. 61, *a–h*).

Eulalia viridis, Fauvel, 1923, p. 160, fig. 57, *a–h* (Synonymy); 1930, p. 12.

Prostomium rounded. Median tentacle longer, inserted between the eyes. Very long proboscis beset with very numerous small papillae. Tentacular cirri cylindrical or slightly spindle-shaped, inserted on three distinct segments. Dorsal cirri enlongated, lanceolate. Compound setae with rather short terminal piece. Body long and slender.

Length: 50–150 mm. by 2–3 mm.

Colour: Bright green in life, dark olive or yellowish-brown in spirit. Var. *aurea* Gravier, gold yellow.

Occurrence: Pamban.

Distribution: Cosmopolitan. Atlantic, Indian and Pacific Oceans.

102. Eulalia albo-picta Marenzeller. (Fig. 60, *a—b*)

Eulalia albo-picta, Marenzeller, 1879, p. 128, pl. III, fig. 3: Izuka, 1912, p. 207: Fauvel, 1932, p. 71.

Prostomium broader than long. Median tentacle arising from the middle of the dorsal surface of the prostomium, somewhat longer than the paired ones. Two large round eyes. First pair of tentacular cirri borne on the first segment, second and third pair borne on the

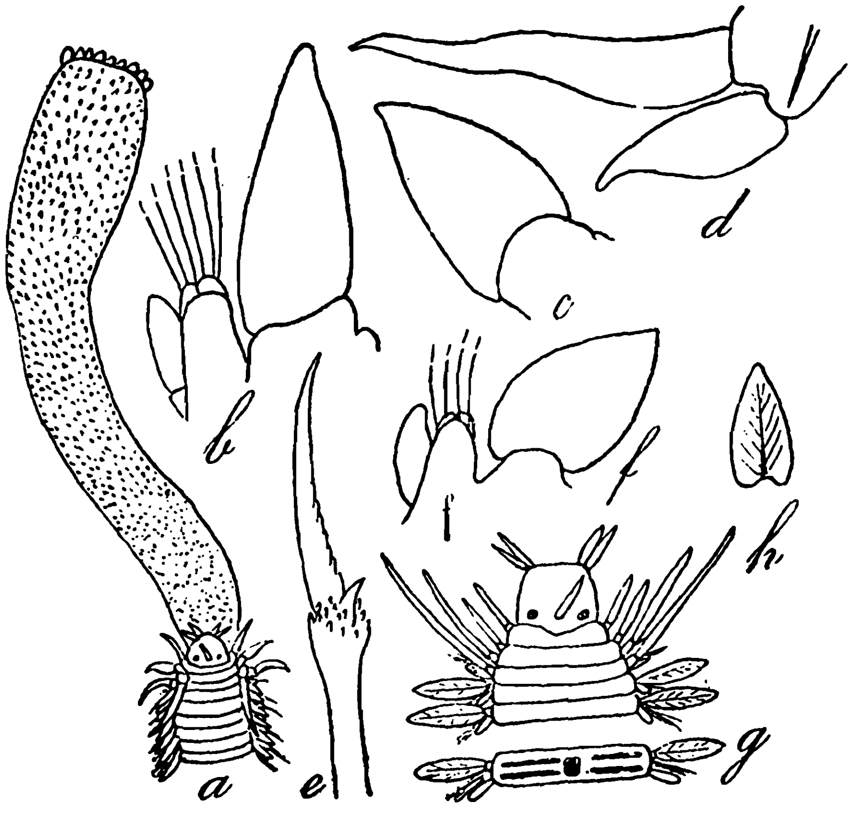


Fig. 61.—*Eulalia viridis* (Müller): *a*, anterior part, enlarged; *b*, average foot ×40; *c*, another dorsal cirrus ×40; *d*, 2nd and 3rd tentacular cirri ×40; *e*, bristle ×400. var. *aurea* Gravier: *f*, foot ×40. var. *ornata* Saint-Joseph: *g*, head and middle segment ×30; *h*, dorsal cirrus ×20.

second, which has a pair of rudimentary parapodia with bristles; fourth pair borne on the third segment. Dorsal cirri cordate, with sharply pointed tips and broad bases, in anterior segments; they become lanceolate in the posterior part of the body. Ventral cirri cordate, much smaller than the dorsal, shorter than the foot.

Length: 20 mm. by 3—4 mm.; setae included.

Colour: Irregular, transversely elongated, white spots on the back.

Occurrence: Nankauri Harbour; Nicobar Islands.
Distribution: South Japan; Nicobar Islands.

Subgenus PTEROCIRRUS Claparède.

Ventral tentacular cirrus of the second segment flattened and winged.

103. Eulalia (Pterocirrus) magalhaensis Kinberg. (Fig. 62)

Eulalia magalhaensis, Kinberg, 1857–1910, p. 55, pl. XXXIII, fig. 1: Fauvel, 1919, p. 364, fig. 3; 1932, p. 71.
Steggoa magalhaensis, Bergström, 1914, p. 129, fig. 35.
Eulalia tenax, Grube, 1878, p. 99, pl. VI, fig. 3.

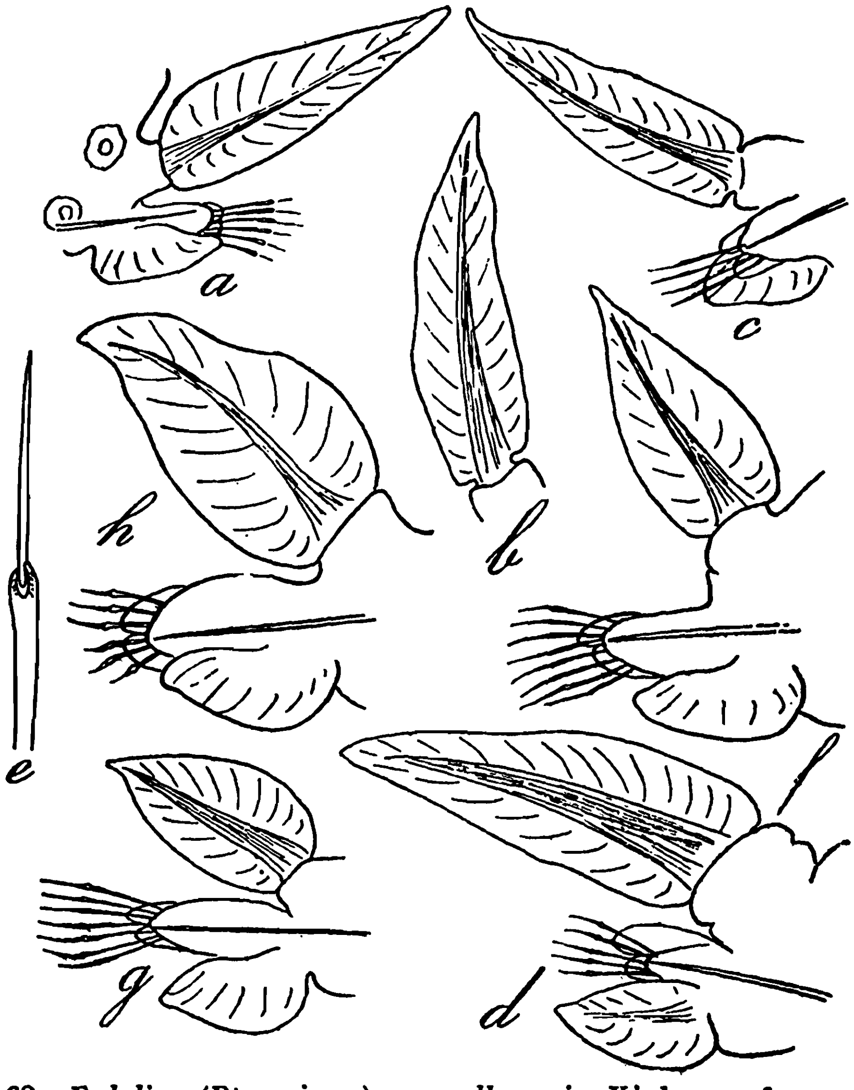


Fig. 62.—*Eulalia* (*Pterocirrus*) *magalhaensis* Kinberg: forma *tenax* Grube (from Persian Gulf): *a*, foot ×40; *b*, *c*, foot and dorsal cirrus (from Red Sea): forma *brevicornis* Augener (from Australia): *d*, foot ×30; *e*, compound seta from 2nd tentacular cirrus ×660; forma *ceylonicus* Willey: *f*, male, foot ×40; *g*, female, foot ×40; *h*, specimen from Aden; foot ×40.

Pterocirrus brevicornis, Ehlers, 1904, p. 17, pl. II, figs. 10–12.
Pterocirrus ceylonicus, Willey, 1905, p. 266: Fauvel, 1918, p. 356.
Steggoa brevicornis, Augener, 1927a, p. 120.

Prostomium oval. Two large eyes. Tentacles subequal, longer than the prostomium. Three tentacular segments distinct. Ventral cirrus of the second tentacular pair flattened and winged. Proboscis covered with small papillae. Dorsal cirri elongated, lanceolate. Ventral cirri short and blunt.

Length: 30–80 mm. by 0.5–1 mm.

Colour: In spirit, dark greenish-brown.

Occurrence: Singapore; Mergui Archipelago; Gulf of Mannar; Ceylon.

Distribution: South Pacific Ocean, Australia, New Zealand, Philippine Islands; Bay of Bengal, India, Persian Gulf, Red Sea.

Subgenus EUMIDA Malmgren.

Proboscis smooth.

104. **Eulalia (Eumida) sanguinea** Oersted. (Fig. 63, *f–k*)

Eulalia (Eumida) sanguinea Oersted, Fauvel, 1923, p. 116, fig. 59, *f–k;* 1930, p. 12.
Eumida communis, Gravier, 1896, p. 18, pl. XVI, figs. 7–10.
Eulalia pallida, Claparède, 1868, p. 246, pl. XVI, fig. 61.

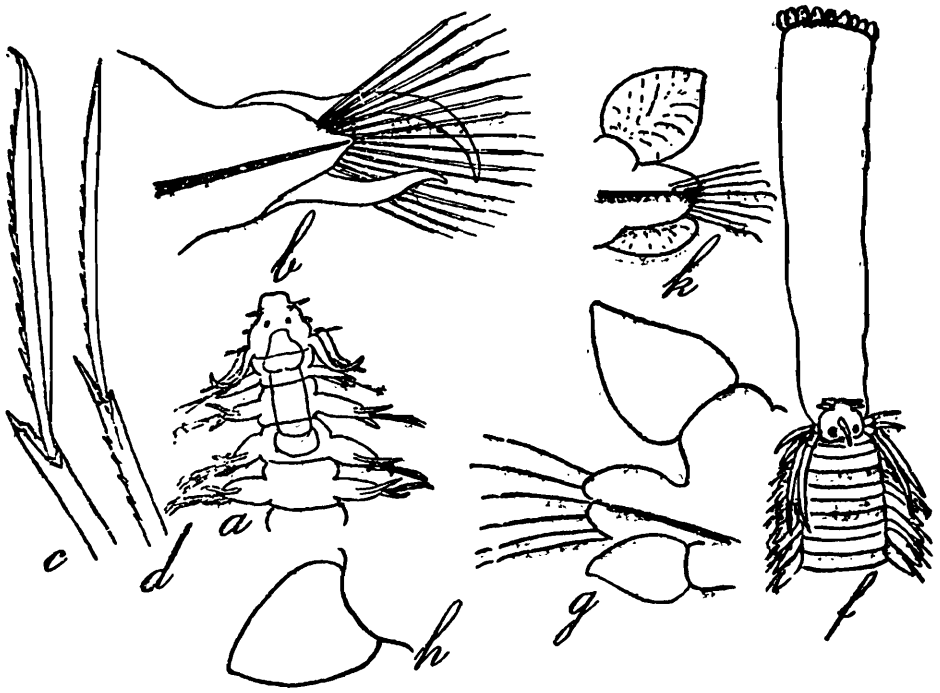


Fig. 63.—*Pelagobia longicirrata* Greeff: *a,* anterior part, ×29 (after Reibisch); *b,* foot; *c,* bristle ×124; *d, Proserrate* bristle ×124. *Eumida sanguinea* Oersted: *f,* head ×17; *g,* female, foot ×33; *h,* dorsal cirrus of male ×33; k. var. *communis* Gravier: foot ×49 (after Gravier).

Body rather short and attenuated at both extremities. Prostomium heart-shaped, broader than long. Two black eyes. Tentacles short, the median longer and inserted in front of the eyes. *Proboscis smooth.* Tentacular cirri cylindrical. Dorsal cirri heart-shaped, ventral cirri lanceolate, shorter than the foot. Setae with swollen, spinous shaft and long terminal pieces.

Length: 30–60 mm.

Colour: Very variable in life, violet, ochraceous, yellow, red-brown, or spotted.

Occurrence: Gulf of Mannar; Persian Gulf.

Distribution: New Zealand; Annam; Indian Ocean, Persian Gulf; Atlantic Ocean, Mediterranean Sea.

Genus NOTOPHYLLUM Oersted.

Body thick. Prostomium conical or rounded. Two eyes. *Five tentacles.* Four pairs of tentacular cirri, borne on three distinct segments. Dorsal cirri broad and foliaceous. *Parapodia biramous.* Dorsal setae simple, ventral setae compound. Two anal cirri. Proboscis with soft, diffuse papillae. *Nuchal organs cirriform or foliaceous, hanging backwards.*

105. **Notophyllum splendens** (Schmarda). (Fig. 60 c).

Notophyllum splendens, Augener, 1913, p. 140, fig. 11: Fauvel, 1930, p. 515.
Macrophyllum splendens, Schmarda, 1861, p. 82, pl. XXIX, fig. 227.
Notophyllum laciniatum, Willey, 1905, p. 263, pl. III, figs. 61–62.
Notophyllum imbricatum, Moore, 1906, p. 217, pl. X, figs. 1–3.
Phyllodoce multicirris, Grube, 1878, p. 100, pl. VI, fig. 4.

Body short and thick. Prostomium rounded, with median tentacle between two large eyes. Behind the prostomium two pairs of occipital lappets, hanging backwards, and each divided into three cirriform processes. Tentacles and palps fusiform. Two pairs of tentacular cirri shorter than the others. Broad reniform, closely imbricating, dorsal foliaceous cirri. Dorsal ramus with one aciculum and a few simple setae. Ventral setae compound, with rather long serrulate end-piece.

Length: 15–50 mm. by 1–4 mm.

Colour: Greenish or brownish, in spirit.

Occurrence: Gulf of Mannar; Ceylon.

Distribution: Alaska; Japan; Australia; New Caledonia; Philippine Islands; Ceylon.

Genus ETEONE Savigny.

Body linear, segments numerous. Prostomium triangular, with four small tentacles on the truncate anterior border. Generally two small eyes. Two pairs of tentacular cirri. Dorsal cirrus absent on the second setigerous segment. Proboscis smooth, or with soft papillae and small chitinous tubercles. Dorsal and ventral cirri foliaceous. Setae compound.

Key to the species of Eteone

Proboscis smooth, or with soft papillae. (Subgenus *Eteone*)	*barantollae* Fauvel, p. 127.
Proboscis with lateral rows of large, soft papillae and small spinous tubercles (Subgenus *Mysta*)	*ornata* Grube, p. 128.

106. Eteone barantollae Fauvel. (Fig. 64, *a–d*)

Eteone barantollae, Fauvel, 1932, p. 72, fig. 13.

Body filiform, sub-cylindrical, segments very numerous. Prostomium broader than long, notched on each side. Two very small black eyes. Four small, short, knob-like tentacles. Proboscis smooth and transparent at the base, and with five longitudinal rows of large, soft, depressed,

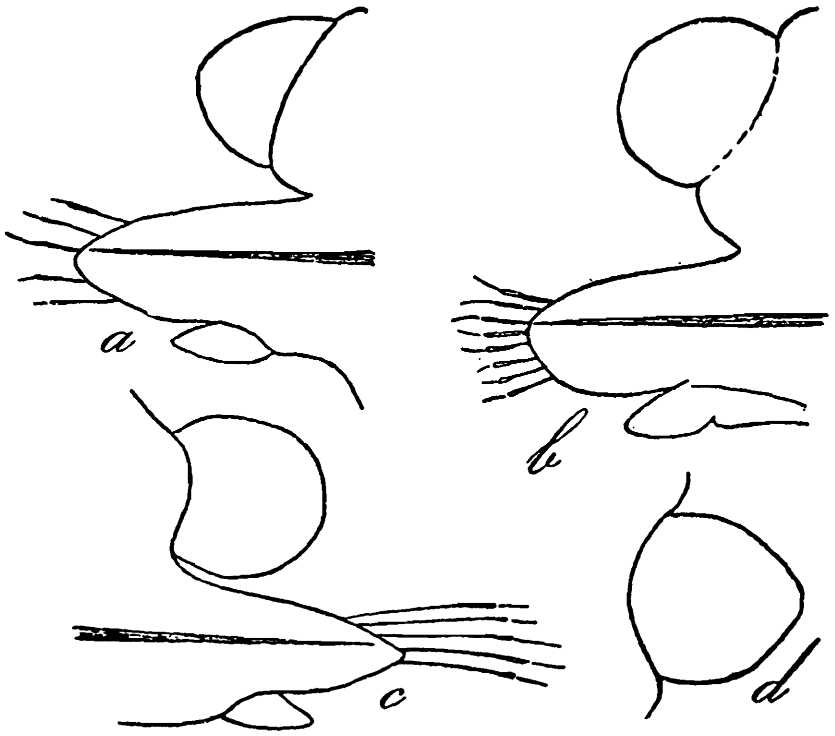


Fig. 64.—*Eteone barantollae* Fauvel: *a, b,* anterior foot, front and back view ×112; *c,* foot from mid-body ×112; *d,* posterior dorsal cirrus ×112.

rounded or squarish papillae anteriorly. The median dorsal row is broader than the lateral ones which are parted, on the ventral side, by a smooth longitudinal stripe. Two pairs of tentacular cirri subulate, somewhat lanceolate and flattened; the ventral larger than the dorsal, reaching backwards to the 4th segment. On the 2nd segment a setigerous foot and a ventral cirrus, *but no dorsal cirrus;* average dorsal cirri small, rather thin, rounded or semi-oval, more or less symmetrical, borne on a large and short cirrophore. Feet conical, elongate. Ventral cirri conical or oval, relatively narrow and much shorter than the foot. Setae short, and shaft swollen at the joint. Anal cirri foliaceous, lanceolate.

Length: 30—35 mm. by 1.5—2 mm.

Colour: In spirit yellowish-white, cirri and feet lighter.

Occurrence: Banks of the canal near Barantolla, Salt-Water Lakes, near Calcutta.

107. **Eteone (Mysta) ornata** Grube. (Fig. 65 *a—d*)

Eteone ornata, Grube, 1877, p. 106; 1879, p. 15: Izuka, 1912, p. 201: Fauvel, 1932, p. 78.

Mysta maculata, Treadwell, 1920, p. 593, figs. 1—4.

" Body elongated, with three striking longitudinal rows of violet pigment spots upon a pale-yellowish colour, towards the middle part of the body the pigment spots become gradually smaller and blend into a single streak, while in the posterior region of the body they entirely disappear. Dorsal cirri comparatively small and borne on a distinct stalk, as in *E. armata* Claparède (1868) and *E. siphonodonta* D. Ch. Prostomium roundish, triangular, somewhat broader than long, and longer than the peristomium; two eyes, small and dot-like." (*Izuka*) Prostomium notched on each side.

Occurrence: Sandheads.

Distribution: North Japan Seas; Philippine Islands; India.

Genus PARALACYDONIA Fauvel.

Prostomium conical; four small tentacles at the tip. Peristomium achaetous and destitute of tentacular cirri. First setigerous segment uniramous. Succeeding segments biramous, dorsal and ventral divisions wide apart. Dor-

sal and ventral cirri not foliaceous. Dorsal setae simple, ventral ones compound. Proboscis unarmed.

108. **Paralacydonia weberi** Horst. (Fig. 65, *e, f*)

Paralacydonia weberi, Horst, 1922, p. 221, figs. 1–2: Fauvel, 1932, p. 74.

Paralacydonia mortenseni, Augener, 1924, p. 311, fig. 3; 1927b. p. 344.

Body flattened, square in section. Tentacles bi-annular. Eyes absent. The buccal segment and the first two setigerous ones bear, on their dorsal side, a transverse ridge-shaped enlargement and constitute together a kind of shield provided with two shallow grooves behind the head. Parapodia resembling those of *Nephthys*. Dorsal ramus with a low, rounded, notched anterior lip; posterior

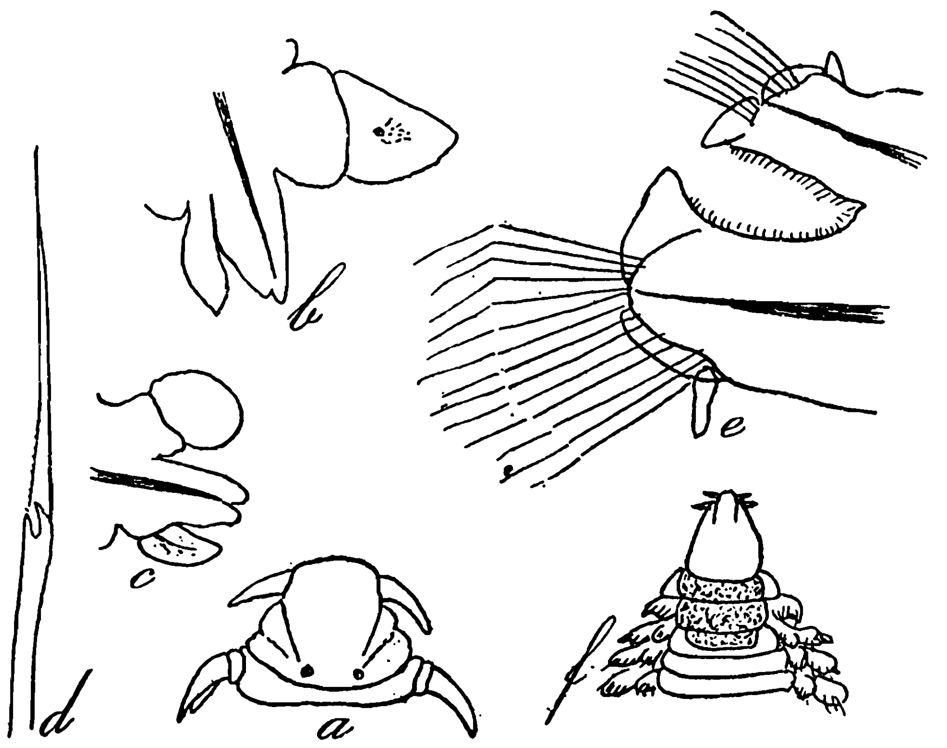


Fig. 65.—*Eteone ornata* Grube (=*Mysta maculata*?) *a*, head ×17; *b*, foot from mid-body ×37; *c*, 15th foot ×37; *d*, compound seta ×243 (after Treadwell). *Paralacydonia weberi* Horst: *e*, foot from mid-body (after Horst); *f*, anterior part.

lip without lobes; a short erect dorsal cirrus and a bundle of simple setae. Ventral ramus with a short rounded posterior lip, an anterior one bilobed, the upper lobe large, triangular, erect, the inferior lobe smaller, rounded; a digitiform ventral cirrus, a fascicle of heterogomph compound bristles and *no inferior simple setae*. In the space between both foot-lobes the border is densely beset with long cilia.

Length: 25–35 mm. by 4 mm., feet included.

Colour: In spirit, a V-shaped streak of pigment at the base of the prostomium, in front of the two rectangular pads of the shield, with a small rounded external dot. Faint transverse streaks of pigment on several segments.

Occurrence: Off Akyab, Burma, 250 fms.

Distribution: Samoa; East Indies; south of Flores; New Zealand; Burma.

Genus LOPADORHYCHUS Grube.

Body short, prostomium broad. Two eyes. Four tentacles. Two pairs of large tentacular cirri, and a third, rudimentary or wanting, inserted on an achaetous segment fused with the prostomium. Setae simple on the first and succeeding segments; next, simple and compound setae. Dorsal and ventral cirri foliaceous. Feet conical with a rounded lamella. Proboscis unarmed.

109. Lopadorhynchus uncinatus Fauvel. (Fig. 66)

Lopadorhynchus uncinatus, Fauvel, 1916a, p. 57, pl. I, figs. 2, 3, pl. IV, figs. 4–14; 1923a, p. 184, fig. 67; 1932, p. 75: Monro, 1937, p. 266.

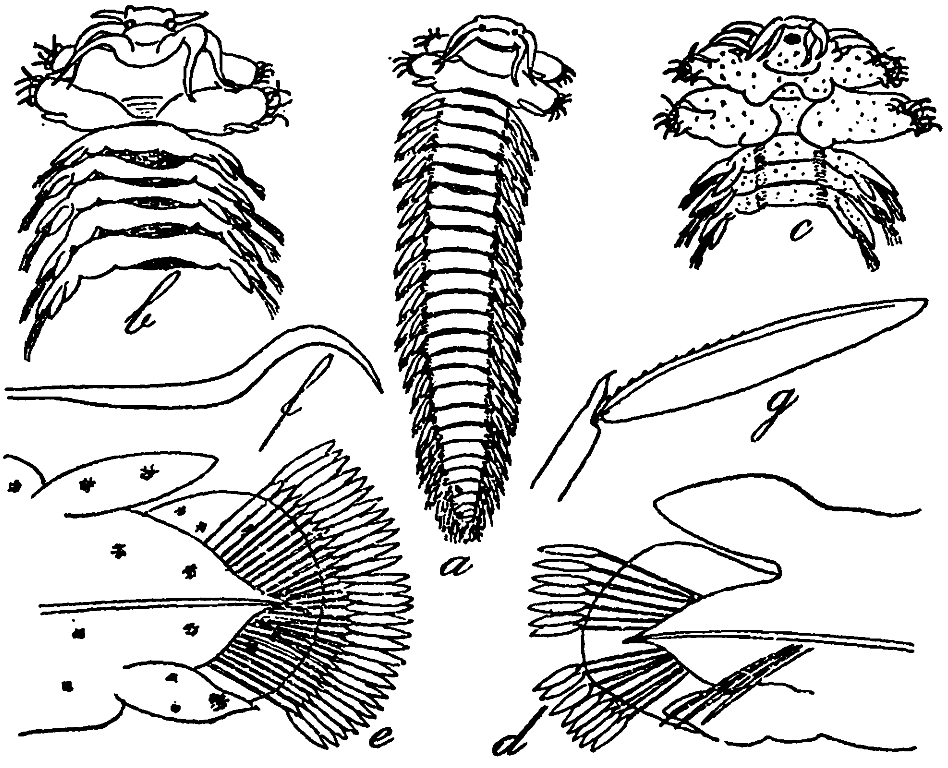


Fig. 66.—*Lopadorhynchus uncinatus* Fauvel: *a*, whole animal ×4; *b*, anterior part dorsal view and *c*, ventral view ×6; *d*, 3rd setigerous segment ×23; *e*, 19th setigerous segment ×23, *f*, hook from the 1st setigerous segment ×23; *g*, compound bristle ×78.

Body divided into two clearly distinct regions, 25–32 segments. Third pair of tentacular cirri reduced to a small conical process inserted on the base of the second pair. The first two setigerous segments resemble each other; *they are much larger than the succeeding ones,* point forwards, and are armed with stout sigmoid sharp brown hooks. Both are destitute of ventral cirri, but have a collar.

Length: 9–20 mm. by 2.5 mm.

Colour: In spirit yellowish and dotted with small star-shaped brown markings.

Occurrence: Reef on N. side of Faladu Island, Horsburg Atoll, Maldive Archipelago.

Distribution: Maldive Archipelago; Atlantic Ocean, Mediterranean Sea.

Genus PELAGOBIA Greeff.

Four tentacles. No palps. Two pairs of tentacular cirri on the same segment. Dorsal cirrus of the next setigerous segment reduced. Parapodia uniramous. Dorsal and ventral cirri slender, elongate. Setigerous lobe with one aciculum and compound setae with a denticulate terminal piece. Two anal cirri. Proboscis smooth with numerous small glands.

110. Pelagobia longicirrata Greeff. (Fig. 63, *a–d*)

Pelagobia longicirrata, Greeff, 1879, p. 247, pl. XIV, figs. 23–25: Fauvel, 1923a, p. 192, fig. *a–c;* 1939, p. 276: Bergström, 1914.

Body short, small, broad in the middle, 15–24 segments. Tentacles filiform. Proboscis cylindrical, unarmed, with longitudinal glands. Tentacular cirri subulate, equal, with a small setigerous lobe and short setae. Dorsal cirrus of the second setigerous segment wanting. Next, long dorsal cirri; ventral ones shorter: a conical lobe with an aciculum and compound setae with a very slightly denticulate or smooth shaft and terminal piece with a sharp denticulate edge and the other winged, smooth.

Length: 3–8 mm.

Colour: Colourless, transparent, or orange-red or dark-red, in life.

Occurrence: India.

Distribution: Japan; Indo-China; Indian Ocean; Mediterranean Sea; Antarctic Ocean.

Family ALCIOPIDAE Ehlers.

Transparent, pelagic. Prostomium small, between two very large spherical red eyes. Five short and simple tentacles. Proboscis crowned with a row of papillae and, often, two very long lateral ones. Parapodia uniramous; dorsal and ventral cirri foliaceous. Setae simple or compound. Dark segmental glands. One or two anal cirri.

Key to the genera.

1. Setae all alike ..	2
Setae of several kinds	4
2. Capillary simple setae	*Alciopa* Audouin & M.-Edwards, p. 133.
Compound setae	3
3. Parapodia with a single cirriform process	*Vanadis* Claparède, p. 135.
Parapodia with two cirriform processes ..	*Greeffia* McIntosh, p. 135.
Parapodia without any cirriform process	*Asterope* Claparède, p. 132.
4. Simple capillary and acicular setae. Parapodia without a cirriform process	*Corynocephalus* Levinsen, p. 137.
Compound and acicular setae. Parapodia without cirriform process ..	*Rhynchonerella,* Costa, p. 137.

Genus ASTEROPE Claparède.

Body short, cylindrical. Five short tentacles, the median reduced to a mere tubercle. Proboscis with two long lateral papillae and *horny denticles.* Three pairs of tentacular cirri. Broad foliaceous dorsal and ventral cirri. *Parapodia without cirriform processes.* Setae compound with a long slender terminal piece. Segmental glands coloured and bulging. Pelagic.

111. Asterope candida (Delle Chiaje) (Fig. 67, *a—d*).

Asterope candida, Fauvel, 1923, p. 202, fig. 75 (Synonymy).

Two pairs of very small lateral tentacles. Tentacular cirri of the first pair longer and united at the base by a transverse membrane. The first two setigerous segments rudimentary and, in the female, with dorsal cirri modified into globular seminal pouches. Dorsal cirri lanceolate; ventral cirri oval. A jutting acicular bristle, and long, slender, compound setae. Pelagic.

Length: 150—250 mm. by 2—3 mm.

Colour: transparent, with red eyes; segmental glands brown or violet.

Occurrence: In plankton.

Distribution: China Sea; Annam; Indian Ocean; Atlantic Ocean; Mediterranean Sea.

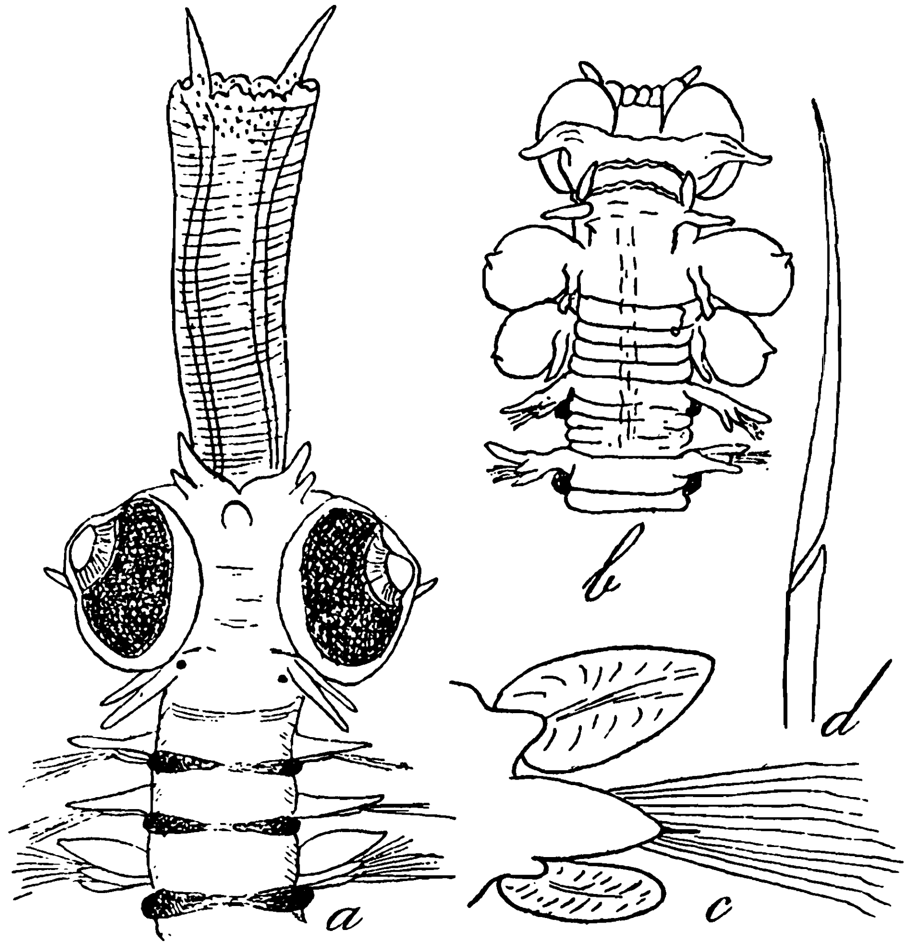


Fig. 67.—*Asterope candida* (Delle Chiaje): *a*, male, anterior part ×10 (after Claparède); *b*, female, ventral view, with four seminal pouches (after Hering); *c*, foot ×25; *d*, bristle ×400.

Genus ALCIOPA Audouin and Milne-Edwards.

Body cylindrical, transparent. Five tentacles, the median one reduced to a mere tubercle. Proboscis short, with two long lateral papillae, *without horny denticles*. Three pairs of tentacular cirri. First three setigerous segments rudimentary. Dorsal and ventral cirri foliaceous. *Feet without cirriform processes*. Setae capillary, *simple*. Segmental glands coloured and bulging. Pelagic.

112. Alciopa cantrainii Delle Chiaje. (Fig. 68 *a—c*).

Alciopa cantrainii, Fauvel, 1923, p. 203, fig. 76 (Synonymy).

Body abruptly attenuated forward and backward, rather plump and short. 70—120 segments. Median tentacle ovoid. Lateral tentacles spindle-shaped. Large spherical eyes, obliquely directed. Proboscis short, crowned with trilobed papillae, the two lateral ones a little

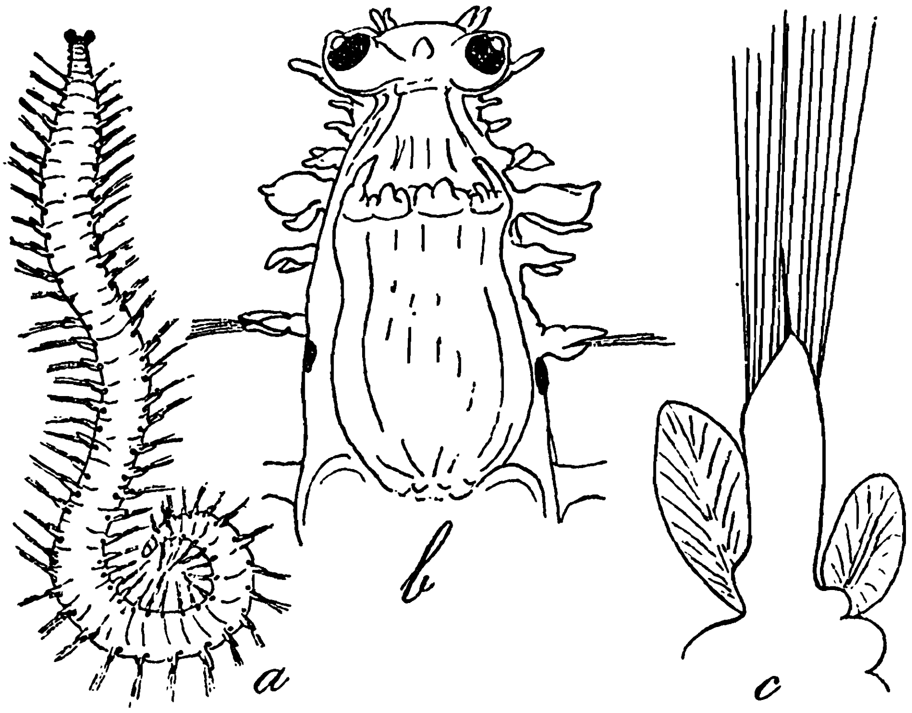


Fig. 68.—*Alciopa cantrainii* Delle Chiaje: *a*, male ×2 (after Greeff); *b*, female, anterior part, with two seminal pouches (after Hering); *c*, foot from mid-body ×35.

longer. First three pairs of feet reduced to dorsal and ventral fusiform cirri and acicular bristles. In the female, two globular seminal pouches on the second segment. The next dorsal cirri foliaceous, oval. Ventral cirri similar, smaller. Feet without cirriform process, with a long jutting acicular bristle and long, slender, simple capillary setae.

Length: 40—110 mm. by 2—5 mm.

Colour: Transparent, with red eyes; segmental glands brown.

Occurrence: Singapore, in plankton.

Distribution: Pacific, Indian and Atlantic Oceans; Mediterranean Sea.

Genus VANADIS Claparède. (*Alciopa*, pro parte)

Body long, transparent; segments very numerous. Five short tentacles. Proboscis cylindrical, with two very long lateral papillae, without horny denticles. 3—4 pairs of tentacular cirri. Dorsal and ventral cirri foliaceous. *Feet with a cirriform process.* Setae all alike, *compound*, with a long, slender, terminal piece. Segmental glands strongly coloured. Pelagic.

113. Vanadis formosa Claparède. (Fig. 70, *a—c*)

Vanadis formosa, Fauvel, 1923a, p. 205, fig. 77. (Synonymy): Monro, 1937, p. 268.

Body very long, 200 segments or more. Median tentacle cirriform; two pairs of lateral tentacles alike. Two large spherical eyes directed downwards. Proboscis long, with trilobed papillae and two lateral, very long, cirriform ones. Three pairs of tentacular cirri, the first longer. First pair of feet reduced to dorsal and ventral cirri. Two pairs of seminal pouches in the female. Feet from the 2nd, in male, and 3rd, in female, with a heart-shaped elongate dorsal and ventral cirrus, a long cirriform process, a jutting aciculum and long compound setae with a slender terminal piece. Pelagic.

Length: 200—300 mm. by 5—6 mm.

Colour: Transparent with red eyes; brown segmental glands.

Occurrence: Arabian Sea, in plankton.

Distribution: Pacific Ocean; Indian Ocean; Arabian Sea; Atlantic Ocean; Mediterranean Sea.

Genus GREEFFIA McIntosh.

Body short. Five tentacles. Proboscis with two long lateral papillae, without horny denticles. *Three or four pairs of tentacular cirri.* There are no rudimentary feet. Dorsal and ventral cirri foliaceous. *Feet with two cirriform processes.* Setae *compound*, with long terminal piece. Dorsal and ventral segmental glands coloured.

114. Greeffia celox (Greeff) (Fig. 69 *a—c*)

Greeffia celox, Fauvel, 1923a, p. 208, fig. 78 *a—c*; 1939, p. 283.

Nauphanta celox, Greeff 1876, p. 69, pl. IV, figs. 40—42.

? *Greeffia oahuensis* McIntosh, Monro, 1930, p. 82, fig. 25.

Body somewhat broad and short, tapering backwards. About 60 segments. Median and lateral tentacles short, alike. Proboscis short, with two cirriform papillae. Three or four pairs of short tentacular cirri. All feet well developed. Dorsal cirri foliaceous, heart-shaped, imbricated. Ventral cirri rounded. Feet with two cirriform processes. Aciculum little or not jutting. Long compound setae with short terminal piece. Dorsal transverse segmental glands and globular ventral glands under the feet. Pelagic.

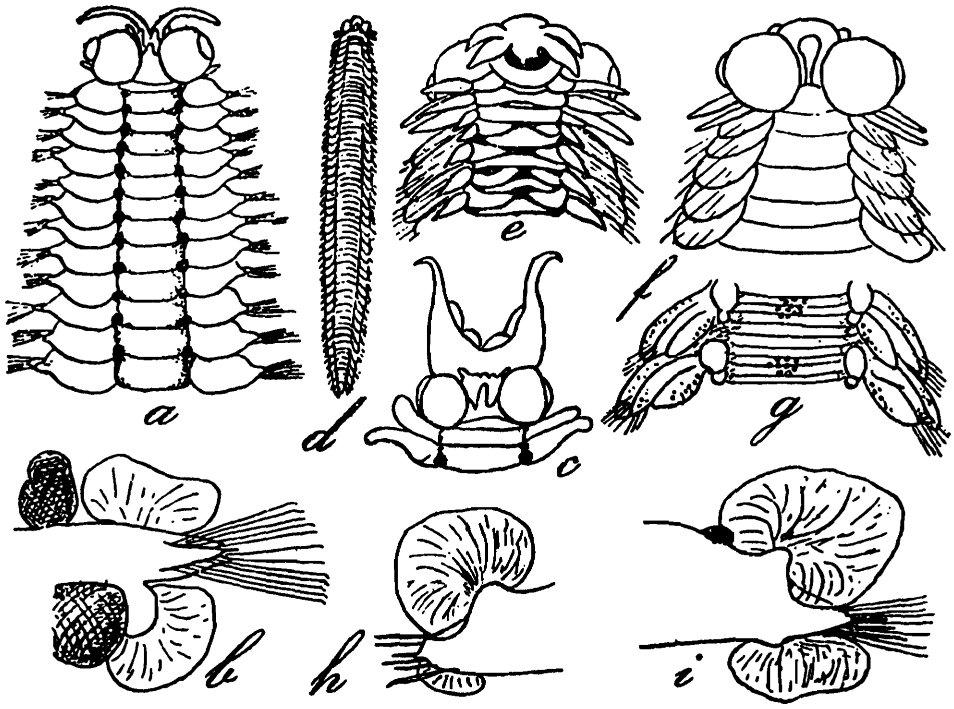


Fig. 69.—*Greeffia celox* (Greeff): *a*, anterior part ×16 (after Greeff); *b*, foot ×12; *c*, proboscis (after Apstein). *Corynocephalus albomaculatus* Levinsen: *d*, dorsal view; *e, f*, anterior part, dorsal and ventral view, enlarged; *g*, ventral view of two segments with papillae (after Levinsen); *h*, anterior foot ×20; *i*, foot from mid-body (after Apstein).

Length: 20–60 mm. by 6–12 mm.

Colour: Transparent with red eyes; segmental glands very dark.

Occurrence: Cauda, Poulo Condore; in plankton.

Distribution: Pacific, Indian, Atlantic and Antarctic Oceans.

Remarks: Greeff attributes four pairs of tentacular cirri to this species. In European, as well as Indian Ocean specimens, I have always found only three pairs.

Genus CORYNOCEPHALUS Levinsen.

Body short, plump, segments few. Median tentacle carinated. Two pairs of lateral tentacles, inserted under the anterior margin of the prostomium. Two large spherical eyes. (Proboscis unknown.) 4—5 pairs of tentacular cirri. There are no rudimentary feet. Large foliaceous, imbricated dorsal cirri. Ventral cirri foliaceous. Feet without cirriform processes. Setae of two kinds: (1) short, acicular; (2) capillary, simple. Large ventral papillae (nephridial ?) under the feet. Dorsal segmental glands small. Pelagic.

115. **Corynocephalus albomaculatus** Levinsen. (Fig. 69, *d—i*).

Corynocephalus albo-maculatus, Fauvel 1923, p. 208, fig. 78, *d—i* (Synonymy); 1939, p. 284.

Alciopina parasitica, Claparède, 1868, p. 253, pl. XXXIII.

Body short and broad, about 50 segments; anterior margin of the prostomium semi-circular. Median tentacle like a claviform crest between the eyes, ending behind in a free tapering tip. Two pairs of lateral tentacles, foliaceous, lanceolate, recurved under the prostomium. 4—5 pairs of tentacular cirri. All feet well developed. Dorsal cirri large, foliaceous, rounded or sub-rhomboidal; imbricated. Ventral cirri oval or subtriangular. Anterior feet with short acicular setae, and, from the fourth setigerous segment backwards, these are mixed up with very slender, simple, capillary setae. From about the 10th segment, large rounded ventral glands on the base of the feet. Dorsal segmental glands small. Pelagic.

Length: 32 mm. by 5 mm.

Colour: Yellowish, with a longitudinal band of white spots on the ventral surface. *Habitat*: when young in the gastro-vascular cavities of *Cydippe* and *Hormiphora*.

Occurrence: Cauda, Ream, Poulo Condore, Ceylon.

Distribution: Indo-China; India; Indian Ocean; Atlantic Ocean; Mediterranean Sea.

Genus RHYNCONERELLA Costa.

Body slender, cylindrical. Five tentacles. Two large spherical eyes. Proboscis with small papillae, without long lateral papillae, without horny denticles. 4—5 pairs of tentacular cirri. There are no anterior rudimentary

feet. Dorsal and ventral cirri broad, foliaceous. Feet without cirriform processes. Setae of two kinds: (1) simple, acicular; (2) compound, with a slender terminal piece. Segmental glands little raised. Pelagic.

116. **Rhynchonerella fulgens** Greeff. (Fig. 70, *a'–d'*).

Rhynchonerella fulgens, Fauvel, 1923, p. 210, fig. 79, *a–d*; 1939, p. 284: Augener, 1926, p. 446, fig. 3: Monro, 1937, p. 268.

About 60–80 segments. Median tentacle spindle-shaped; two pairs of longer, finger-like, lateral tentacles. Proboscis with about twelve short, sub-equal papillae.

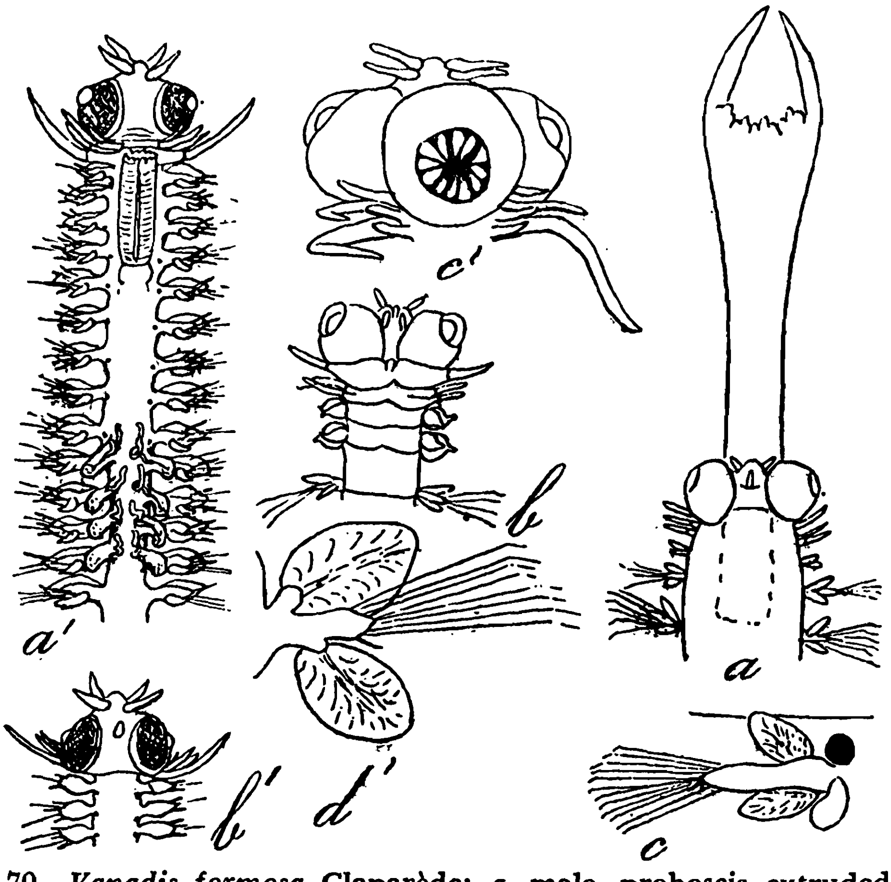


Fig. 70.—*Vanadis formosa* Claparède: *a*, male, proboscis extruded, enlarged; *b*, female, ventral side, with four seminal pouches, enlarged; *c*, foot ×8. *Rhynchonerella fulgens* Greeff, *a'*, male, ventral side, enlarged; *b'*, head (after Greeff); *c'*, proboscis half extruded, ventral view ×25; *d'*, foot (after Apstein).

Five (four?) pairs of tentacular cirri. The dorsal cirrus of the third segment longer and directed forwards, the ventral one very small. From the first setigerous segment all feet well developed, with lanceolate dorsal cirrus; ventral cirrus smaller, oval. Anterior feet with several simple acicular setae and a few compuond setae; next, long slender compound setae and a lower acicular one. Male with large nephridial papillae under feet 10 to 13.

Length: 8—20 mm.

Colour: Transparent with red eyes; segmental glands brownish-red.

Occurrence: Ceylon; Arabian Sea; in plankton.

Distribution: Pacific Ocean, China Sea, New Guinea, Sandwich Islands; India, Arabian Sea; Atlantic Ocean; Mediterranean Sea.

Family TYPHLOSCOLECIDAE Uljanin.

Pelagic. Body cylindrical or fusiform, transparent. Prostomium pointed. Nuchal organs projecting. Dorsal and ventral cirri foliaceous. Parapodia very small, with only an aciculum and a few small acicular bristles. Anal cirri foliaceous.

Genus TRAVISIOPSIS Levinsen.

Prostomium conical, ending in a more or less sharp tip. A large caruncle encircled by two prominent elongated pads (nuchal organs) Dorsal and ventral cirri wide apart. A retort-shaped organ in the head.

117. **Travisiopsis lobifera** Levinsen. (Fig. 71, *a—d*).

Travisiopsis lobifera, Levinsen, 1885, p. 336, pl. I, figs. 17—20: Fauvel, 1916, p. 73; 1923, p. 229, fig. 86; 1932, p. 66: Southern, 1911, p. 33, pl. I, fig. 4.

?*Plotobia simplex*, Chamberlin, 1919, p. 155, pl. 46, fig. 1.

The tip of the prostomium is short. The caruncle is an oval pad encircled by the nuchal organs, which are two elongated cushions projecting backwards, not as far as in *T lanceolata*, as figured by Southern (1911, pl. I, fig. 3) The anterior ends of the nuchal pads do not meet before the caruncle. On each side a large spoon-shaped foliaceous cirrus. One pair of like cirri on the first two segments; next, lanceolate dorsal and ventral cirri provided with special sieve-like cells. Feet with an aciculum and 2 acicular setae. Anal cirri short, broad, rounded or subrectangular, rather variable. Retort organ well marked.

Length: 20—25 mm.

Colour: Yellow; in spirit whitish.

Occurrence: Arabian Sea, 200 fms. to surface.

Distribution: Pacific Ocean (?); Indian Ocean, Atlantic Ocean.

Family TOMOPTERIDAE Grube.

Pelagic. Body translucent, divided into three parts: head, trunk and tail. Two diverging tentacles. One anterior pair of cirri armed with a very long acicular bristle. The other feet biramous and achaetous, with foliaceous margin bearing chromophile glands, hyaline glands or rosettes. Proboscis unarmed.

Genus TOMOPTERIS Eschscholtz.

Prostomium transverse, ovoid. Large eyes. Proboscis long and stout. Both divisions of the parapodia more or less conical, skirted all round by a membranous wing or pinnule.

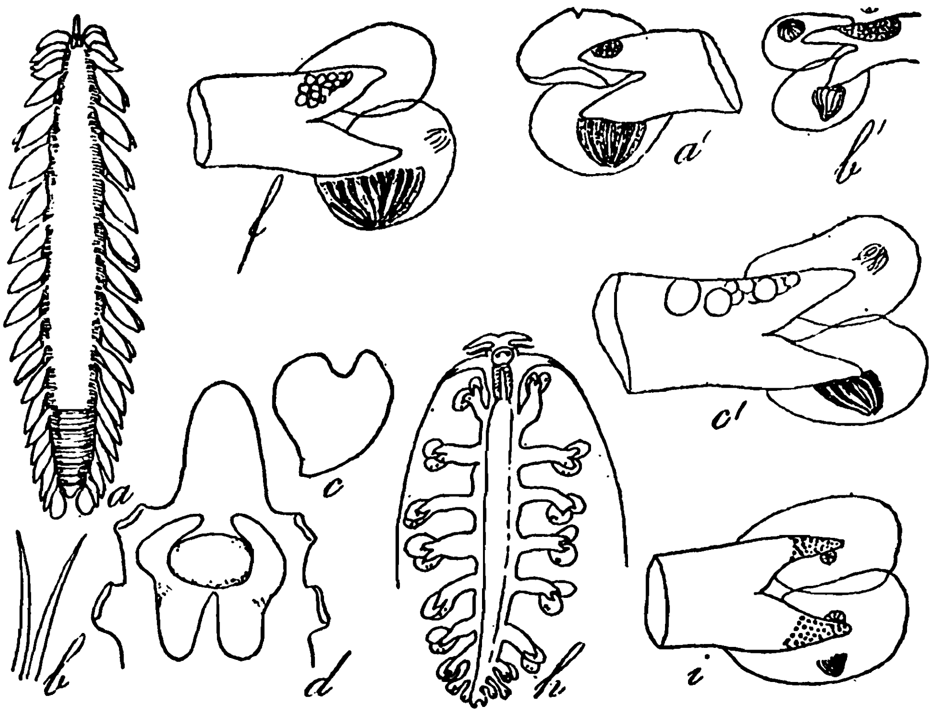


Fig. 71.—*Travisiopsis lobifera* Levinsen: *a*, (after Levinsen); *b*, bristles; *c*, dorsal cirrus; *d*, head, enlarged (after Southern). *Tomopteris planktonis* Apstein: *f*, 7th foot (after Malaquin and Carus). *T. helgolandica* Greeff: *h*, young specimen ×15 (after Apstein); *i*, 6th foot (after M. and G.). *T cavallii* Rosa: *a′*, 5th foot (after Rosa). *T. elegans* Chun: *b′*, 4th foot (after Rosa); *c′*, 4th foot (after Malaquin).

Subgenus TOMOPTERIS s. str.

Rosettes absent, hyaline glands generally present. Tail and first cirrus nearly always absent.

Key to the species of Tomopteris (Tomopteris).

1. With a tail. Hyaline glands dorsal. Chromophile glands ventral	*mortenseni* Augener, p. 141.
Without a tail	2
2. Chromophile and hyaline glands present	3
Hyaline glands absent	*cavallii* Rosa, p. 141.
3. Hyaline glands present only on the dorsal pinnules of 3rd and 4th foot	*elegans* Chun, p. 142.
Hyaline glands only on the ventral pinnules	*planktonis* Apstein, p. 142.

118. Tomopteris (Tomopteris) mortenseni Augener.

Tomopleris mortenseni, Augener, 1927, p. 123, fig. 5: Fauvel, 1932, p. 65.

Body with a short tail of reduced parapodia; about 19 segments preceding the tail. Prostomium convex, not notched. Two large eyes, far apart. First pair of cirri absent. Second pair with bristles longer than the body. Pinnules skirt the parapodia all round, and are more or less frilled and bear very large chromophile glands, from the 4th foot backwards, on the ventral one. Hyaline glands present. Sting absent. (Rosettes on the dorsal trunk of the feet??) Planktonic.

Length: 25 mm.

Occurrence: Arabian Sea.

Distribution: South Australia; Arabian Sea.

119. Tomopteris (Tomopteris) cavallii Rosa. (Fig. 71, *a'*)

Tomopteris cavallii, Rosa, 1908, p. 304, pl. XII, fig. 20: Fauvel, 1923, p. 222: Monro, 1937, p. 269.

Body oval lanceolate, tailless. 15—20 pairs of feet. Prostomium notched. First pair of cirri absent; second pair with birstles about as long as two-thirds of the body. Parapodial rami conical, slightly diverging. Pinnules broad, rounded, overlapping. Big cupola-like chromophile glands on the inferior part of the ventral ramus, from the 4th foot backwards. Rosettes, sting and hyaline glands absent. Planktonic.

Length: 12—13 mm.

Occurrence: North Arabian Sea, Ceylon.

Distribution: Indian and Atlantic Oceans.

120. Tomopteris (Tomopteris) elegans Chun. (Fig. 71, *b′—c′*).

Tomopteris elegans, Rosa, 1908, p. 294, pl. XII, fig. 16. Fauvel, 1923a, p. 223, fig. 84, *b—c.*
Tomopteris kefersteini, Apstein, 1900, p. 41 (*non* Greeff).

Body oval, tailless, 14 pairs of feet. Prostomum conical with a deep notch at the back. First pair of cirri conspicuous, second pair with bristles as long as about two-thirds of the body. Conical lobes of the feet diverging. Pinnules broad, oboval. Apico-inferior bulging chromophile glands on the ventral ramus from the 4th foot backwards. Hyaline glands on dorsal pinnules only on 3rd and 4th feet.

Length: 2—8 mm.

Occurrence: Indian Ocean, India.

Distribution: Indian Ocean; Atlantic Ocean, Mediterranean Sea.

121. Tomopteris (Tomopteris) planktonis Apstein. (Fig. 71, *f*).

Tomopteris planktonis, Rosa, p. 301: Fauvel, 1923, p. 284, fig. 84, *f*: Monro, 1937, p. 270.

Body oval, lanceolate, tailless; 13—18 pairs of feet. Prostomium not notched. First pair of cirri wanting. Second pair as long as three-fourths of the body. Bristles very slender. Parapodial lobes conical, pinnules oval. Voluminous cupola-like chromophile glands near the ventral insertion of the pinnule, from the 4th foot backwards. Transparent hyaline glands only on the ventral rami.

Length: 3—11 mm.

Occurrence: Central Arabian Sea.

Distribution: Arabian Sea; South-Georgia ?; Atlantic Ocean, Mediterranean Sea.

Subgenus JOHNSTONELLA Gosse.

Rosettes present, hyaline glands absent (not always). Generally a well marked tail and a first cirrus.

Key to the species of Tomopteris (Johnstonella)

1. Rosettes on the first two feet and on the pinnules .	2
Rosettes on the ventral part of the first two feet	*helgolandica* Greeff, p. 143.
2. With a tail	3
Tail absent. Only chromophile glands. Sting absent	*rolasi* Greeff, p. 143.

3. Chromophile and hyaline glands present. A ventral sting — *ducii* Rosa, p. 143.
   Chromophile glands only. A ventral sting — 4
4. Body abruptly attenuated into a tail .. .. *aloysi-sabaudiae* Rosa, p. 144.
   Body gradually attenuated into a tail — *dunkeri* Rosa, p. 145.

122. **Tomopteris (Johnstonella) helgolandica** Greeff. (Fig. 71, *h, i*)

Tomopteris helgolandica, Fauvel, 1923, p. 221, fig. 83, *h, i.*
Tomopteris catharina, Rosa, 1908, p. 283.

Prostomium oval, with short tentacles. First pair of cirri often wanting in aged specimens. Second pair with bristles about as long as two-thirds of the body. Parapodial lobes conical, with round or oval pinnules, lanceolate on the tail. A yellow rosette on the ventral ramus of the first two feet. Chromophile glands very small, at the inferior part of the ventral pinnule. Sting absent.

Length: 12—17 mm.

Occurrence: Amboina.

Distribution: Indian Ocean; Atlantic Ocean, Mediterranean Sea.

123. **Tomopteris (Johnstonella) rolasi** Greeff. (Fig. 72, *a*).

Tomopteris rolasi, Greeff, 1882, p. 384: Rosa, 1908, p. 281: Fauvel, 1935, p. 297; 1939, p. 281.

Body tailless; 12—15 pairs of feet. Long tentacles. First pair of cirri sometimes absent. Second pair hardly shorter than the length of the body. Yellow rosettes on the trunk of first and second feet and on the ventral pinnules of all the feet. Chromophile glands large and ventral. Sting absent.

Length: 8—10 mm.

Occurrence: Annam; Gulf of Siam.

Distribution: China Sea; Coast of Guinea; Ambonia; Atlantic Ocean.

124. **Tomopteris (Johnstonella) ducii** Rosa. (Fig. 72, *d*)

Tomopteris ducii, Rosa, 1908, p. 273, pl. XII, figs. 1—2: Monro, 1937, p. 269.

Body with a naked tail, one fifth of the body; 19 pairs of feet. Prostomium convex, not notched. First cirrus

long, second pair with bristles about as long as two-thirds of the body. Chromophile and hyaline glands. Rosettes on the trunk of the first two feet and a smaller one on both pinnules of the third segment and the following ones. *A sting present.*

Length: 20 mm.

Occurrence: Bay of Bengal; Arabian Sea.

Distribution: Pacific Ocean; Bay of Bengal, Arabian Sea; Coast of Mexico.

125. Tomopteris (Johnstonella) aloysi-sabaudiae Rosa.

Tomopteris aloysi-sabaudiae, Rosa, 1908, p. 274, pl. XII, figs. 3–6: Fauvel, 1932, p. 66.

Body abruptly attenuated into a tail about as long as a third of the body, *ending in a naked cylinder.* Pros-

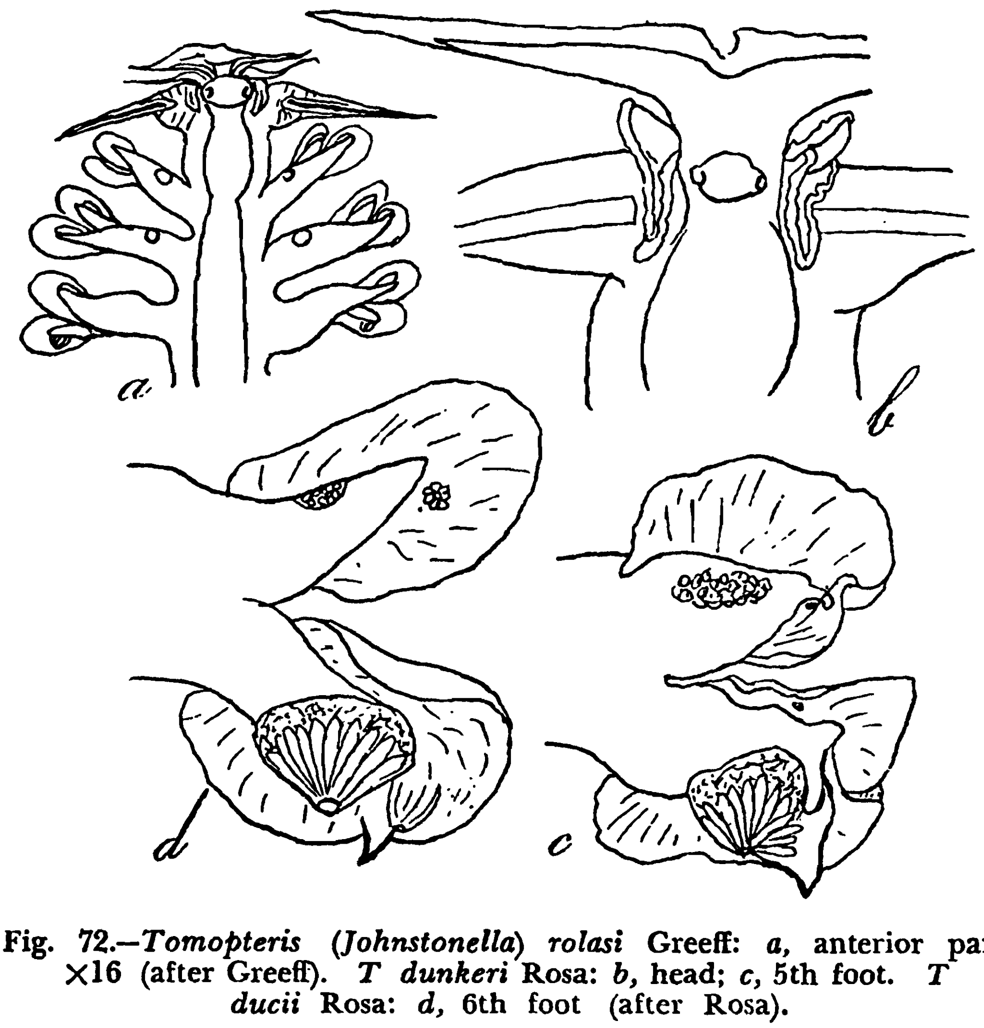


Fig. 72.—*Tomopteris* (*Johnstonella*) *rolasi* Greeff: *a,* anterior part ×16 (after Greeff). *T dunkeri* Rosa: *b,* head; *c,* 5th foot. *T ducii* Rosa: *d,* 6th foot (after Rosa).

tomium slightly notched, with frontal horns. First pair of cirri generally wanting (a small pair on young specimens?) Second pair of cirri with bristle about as long

as two-thirds of the body. *All feet provided with a sting.* On the first two pairs of feet a large rosette on the trunk, and, further back, on the pinnules. A chromophile gland from the first foot backwards. No hyaline glands present.

Length: 15 mm.

Occurrence: Arabian Sea.

Distribution: Arabian Sea; West coast of Mexico.

Remarks: Very close to *T dunkeri;* differs chiefly by its naked tail.

126. **Tomopteris (Johnstonella) dunkeri** Rosa. (Fig. 72, *b, c*)

Tomopteris dunkeri, Rosa, 1908, p. 276, pl. XII, figs. 7–9: Fauvel, 1935, p. 297; 1939, p. 282: Monro, 1937, p. 268.

A tail with reduced feet, about as long as three-fourths of the body, *not naked at the extremity*. A notch between the prostomial lobes. Frontal horns. First pair of cirri often absent. Second pair of cirri with bristles about as long as the body. All feet provided with a sting. On the first two pairs of feet are rosettes on the trunks and, further back, in the pinnules. A chromophile gland from the 3rd foot backwards. No hyaline gland present.

Length: 25 mm.

Occurrence: Ceylon.

Distribution: New Guinea; Indo-China; Gulf of Siam; Indian Ocean, Ceylon, Red Sea.

Family SYLLIDAE Grube.

Body small, slender, elongated. Prostomium generally rounded or quadrangular. Three tentacles, two palps, four eyes. Two pairs of tentacular cirri borne on the first segment, which is achaetous. Proboscis divided into two regions: (1) pharynx, with chitinous walls and one or more teeth and (2) a more or less barrel-shaped proventriculus. Feet uniramous, with a dorsal and a ventral cirrus, of which the latter may, however, be absent. Setae generally compound, with a terminal falcate, unidentate or bidentate, process. Swimming feet with simple dorsal bristles, in sexual forms.

Key to the genera of SYLLIDAE.

1. Ventral cirri absent. Sub-Fam. *AUTOLYTINAE* .. .. *Autolytus* Grube, p. 162.
   Ventral cirri present .. 2

2. Palps not fused. Cirri moniliform. Sub-Fam. *SYLLINAE*	4
Palps fused. Cirri smooth or not clearly articulate	3
3. Palps fused only at the base. Sub-Fam. *EUSYLLINAE* ..	6
Palps entirely fused. Sub-Fam. *EXOGONINAE* ..	*Parasphaerosyllis* Monro, p. 162.
4. Proboscis with a single large tooth	5
Proboscis with a large tooth accompanied with a trepan	*Trypanosyllis* Claparède, p. 156.
5. An anterior tooth	*Syllis* Savigny, p. 146.
A posterior tooth	*Opisthosyllis* Langerhans, p. 153.
6. A single large anterior tooth	*Eusyllis* Malmgren, p. 159.
Several teeth, curved backwards	*Odontosyllis* Claparède, p. 160.

Subfamily *SYLLINAE.*

Palps entirely free. Ventral cirri present. Tentacles and cirri clearly moniliform. Normal and schizogamic reproduction.

Genus SYLLIS Savigny.

Palps separate throughout. Tentacles and dorsal cirri moniliform. Opening of the proboscis with papillae only. A single antero-dorsal conical tooth. Proventriculus short. Ventral cirri present, pinniform, unarticulate. Bristles compound, with falcate terminal piece; rarely simple. Reproduction normal or by alternation of generations.

Key to the species of Syllis.

1. Simple setae only on every segment. Sub-Gen. *Haplosyllis*	*spongicola* Grube, p. 147.
Compound setae	2
2. Anterior setae compound, thereafter simple furcate setae. Sub-Gen. *Syllis* s. str.	*gracillis* Grube, p. 147.
All setae compound	3
3. Normal compound setae and others with a long slender terminal piece. Sub-Gen. *Ehlersia* ..	*cornuta* Rathke, p. 153.
Compound setae more or less alike. Sub-Gen. *Typosyllis*	4
4. Dorsal cirri short, fusiform, with few articles	*closterobranchia* Schmarda, p. 150.

Dorsal cirri elongated, with numerous small articles ..	5
5. Terminal piece of the lower setae a large, blunt simple hook	*exilis* Gravier, p. 151.
Terminal piece of all setae bidentate ..	6
6. Dorsal cirri alternately thick and slender. Shaft of the setae swollen	*krohnii* Ehlers, p. 150.
Dorsal cirri all alike	7
7. Pharynx short. Tooth on the anterior third ..	*prolifera* Krohn, p. 149.
Pharynx long. Tooth more forward	*variegata* Grube, p. 148.
One or two white collars across the back	*okadai* Fauvel, p. 152.

127. **Syllis (Haplosyllis) spongicola** Grube. (Fig. 75, *a—d*).

Syllis (*Haplosyllis*) *spongicola*, Fauvel, 1923a, p. 257, fig. 95; 1932, p. 76: Willey, 1905, p. 269, pl. III, figs. 79—80: Augener, 1924, p. 368: Monro, 1927, p. 273.

Syllis hamata, Claparède, 1868, p. 195, pl. XV, fig. 2.

Syllis djiboutiensis, Gravier, 1900, p. 147, pl. IX, fig. 3: Fauvel, 1919, p. 353.

Body elongate, tapering. Pharynx long, tooth terminal. Proventriculus long. Dorsal cirri elongated, 20—30 articles. Compound setae absent. Simple, stout, hooked bristles, bidentate, with upper tooth simple or bifid.

Length: 20—50 mm.

Colour: Orange or yellowish.

Occurrence: Ceylon, Tuticorin, amongst sponges; Maldive Archipelago.

Distribution: Pacific, Indian and Atlantic Oceans; Mediterranean and Red Sea.

128. **Syllis (Syllis) gracilis** Grube. (Fig. 73, *f—i*).

Syllis gracilis, Fauvel, 1923a, p. 259, fig. 96 (Synonymy); 1932, p. 76: Willey, 1905, p. 269: Gravely, 1927, p. 8: Augener, 1926, p. 432: Monro, 1937, p. 271.

Syllis longissima, Gravier, 1900, p. 159, pl. IX, fig. 7.

Body slender. Pharynx elongated, with anterior tooth. Dorsal cirri short, cylindrical or fusiform, with alternately 7—8 and 10—12 articles. Anterior and posterior setae compound; in the middle region of the body, large simple, ypsiloid, crutch-like setae.

Length: 20–50 mm.

Colour: Pale yellowish brown, with sometimes streaks of small brown dots on the back of the anterior segments.

Occurrence: Andaman Islands; Ceylon; Gulf of Mannar; Tuticorin; Maldive Archipelago.

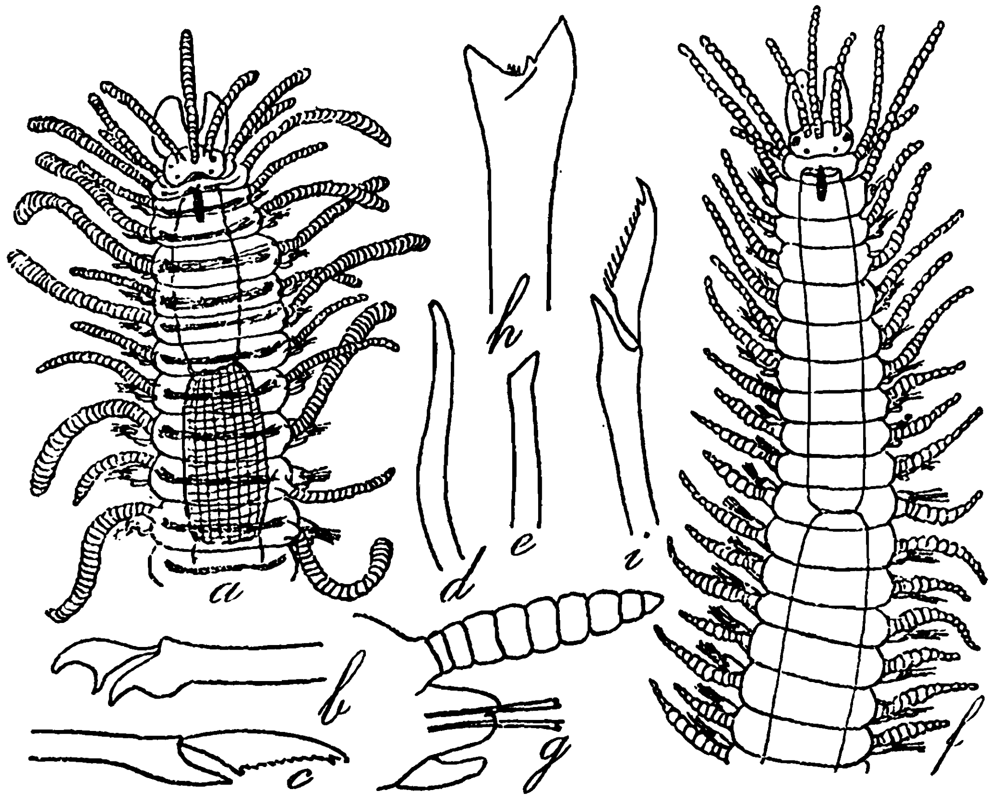


Fig. 73.—*Syllis krohnii* Ehlers: *a*, anterior part, enlarged; *b*, compound bristle from mid-body ×390; *c*, anterior bristle ×390; *d*, simple ventral seta ×390; *e*, aciculum ×390. *S. gracilis* Grube: *f*, anterior part, enlarged; *g*, foot; *h*, stout simple bristle ×390; *i*, compound bristle ×390.

Distribution: Indian Ocean, Persian Gulf, Arabian Sea; Pacific and Atlantic Oceans. Cosmopolitan.

129. **Syllis (Typosyllis) variegata** Grube. (Fig. 74, *h*–*n*).

Syllis (*Typosyllis*) *variegata*, Fauvel, 1923a, p. 262, fig. 7 (Synonymy); 1932, p. 76: Gravely, 1927, p. 8: Pruvot, 1930, p. 31: Monro, 1937, p. 270.

Syllis compacta, Gravier, 1909, p. 165, pl. IX, fig. 11.

Body long and slender, Pharynx more or less elongated, with an anterior conical tooth. Dorsal cirri alternately long and short, with numerous articles (20–25 and 30–45) Falcate terminal piece of all the setae more or less distinctly bidentate. On the last setigerous segments a dorsal and a ventral simple acicular seta.

Length: 10–35 mm.

Colour: Very variable.

Occurrence: Ceylon; Gulf of Mannar; Arabian Sea; Persian Gulf.

Distribution: Pacific, Indian and Atlantic Oceans; Mediterranean Sea.

130. **Syllis (Typosyllis) prolifera** Krohn. (Fig. 74, *a–g*)

Syllis (*Typosyllis*) *prolifera*, Fauvel, 1923a, p. 261, fig. 97, *a–g*. (Synonymy); 1930, p. 13: Pruvot, 1930, p. 31.

Body long and slender. Pharynx rather short, with the conical tooth on the anterior third. Proventriculus

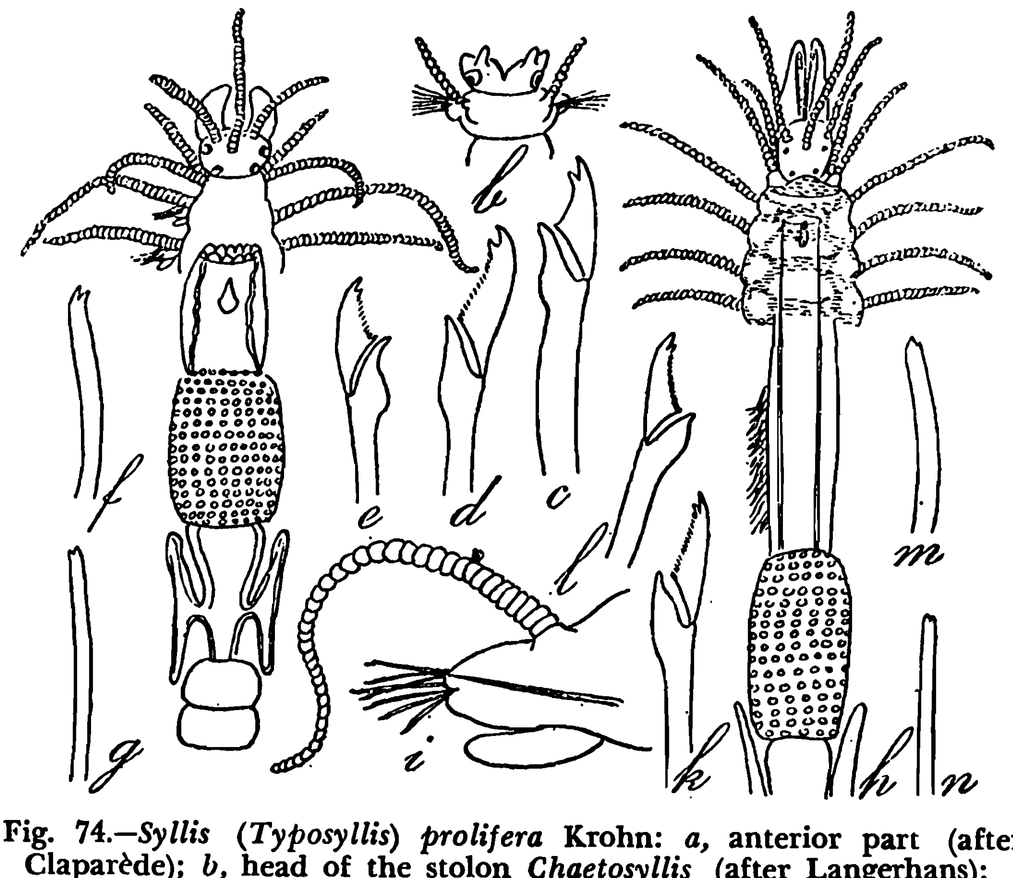


Fig. 74.—*Syllis* (*Typosyllis*) *prolifera* Krohn: *a*, anterior part (after Claparède); *b*, head of the stolon *Chaetosyllis* (after Langerhans); *c, d*, upper and inferior bristles from mid-body ×390; *e*, posterior bristle ×310; *f*, simple ventral seta ×390; *g*, simple dorsal seta ×390. *S.* (*Typosyllis*) *variegata* Grube: *h*, anterior part ×8 (after Claparède); *i*, foot; *k, l*, median and posterior compound bristles ×390; *m, n*, ventral and dorsal simple setae ×390.

short. Dorsal cirri alternately long and short, with numerous articles (20–25 and 30–40). Falcate setae, especially median and posterior ones, short and conspicuously

bidentate. On the last setigerous segments a dorsal and a ventral, simple bidentate, acicular seta.

Length: 10–25 mm.

Colour: Very variable. Anterior part more or less brown, with transverse streaks.

Occurrence: Gulf of Mannar; Ceylon, Shingle Island.

Distribution: Pacific, Indian and Atlantic Oceans; Mediterranean Sea.

Remarks: *S. variegata* and *S. prolifera* are very likely only varieties of a single species.

131. **Syllis (Typosyllis) krohnii** Ehlers. (Fig. 73, *a–e*).

Syllis (Typosyllis) krohnii, Fauvel, 1923, p. 259 *a–c* (Synonymy); 1930, p. 517.

Body thick anteriorly, tapering behind. A well marked occipital protuberance. Pharynx with an anterior conical tooth. Proventriculus short. Anterior dorsal cirri alternately short and long, slender and broad, *more or less swollen at the tip*, with numerous articles, short, close together and spotted. Falcate setae with a shaft swollen at the tip and a short unidentate terminal piece; the anterior ones with a small sub-apical tooth. On the last setigerous segments a dorsal and a ventral, slightly bidentate, acicular seta.

Length: 15–30 mm.

Colour: Transverse violet-brown streaks on anterior segments. Cirri spotted with brown or opaque white dots.

Occurrence: Gulf of Mannar, Shingle Island.

Distribution: New Caledonia; (Australia ?); Indian Ocean; Atlantic Ocean, Mediterranean Sea.

132. **Syllis (Typosyllis) closterobranchia** Schmarda. (Fig. 77, *a–c*).

Syllis closterobranchia, Ehlers, 1904, p. 19, pl. III, figs. 1–4: Augener, 1913, p. 29, fig. 23 (Synonymy): Fauvel, 1919, p. 354; 1930, p. 14; 1932, p. 77.

(?) *Syllis brachychaeta* Schmarda, Augener, 1927a, p. 145: Monro, 1937, p. 271.

(?) *Syllis hyalina*, Willey, 1905, p. 294.

Dorsal cirri short and spindle-shaped. Body slender. In the anterior and posterior regions of the body the

setae are bidentate, in the median their sickle-shaped appendices are large and unidentate and they are very easily detached, the shaft then resembling the ypsiloid setae of S. *gracilis*, but in the latter it is the sickle which is fused with the shaft.

Length: 30 mm.

Uncoloured, in spirit.

Occurrence: Diamond Island, Andaman Island; Gulf of Mannar.

Distribution: Japan; Australia; New Zealand; New Caledonia; Indian Ocean; Red Sea.

133. Syllis (Typosyllis) exilis Gravier. (Fig. 75, *a'–f*)

Syllis exilis, Gravier, 1900, p. 160, pl. X, fig. 19: Fauvel, 1917, p. 195, pl. V, fig. 24; 1930, p. 14; 1932, p. 77: Augener, 1913, p. 192.

?*Syllis solida*, Grube, 1878, p. 120, pl. VII, fig. 7.

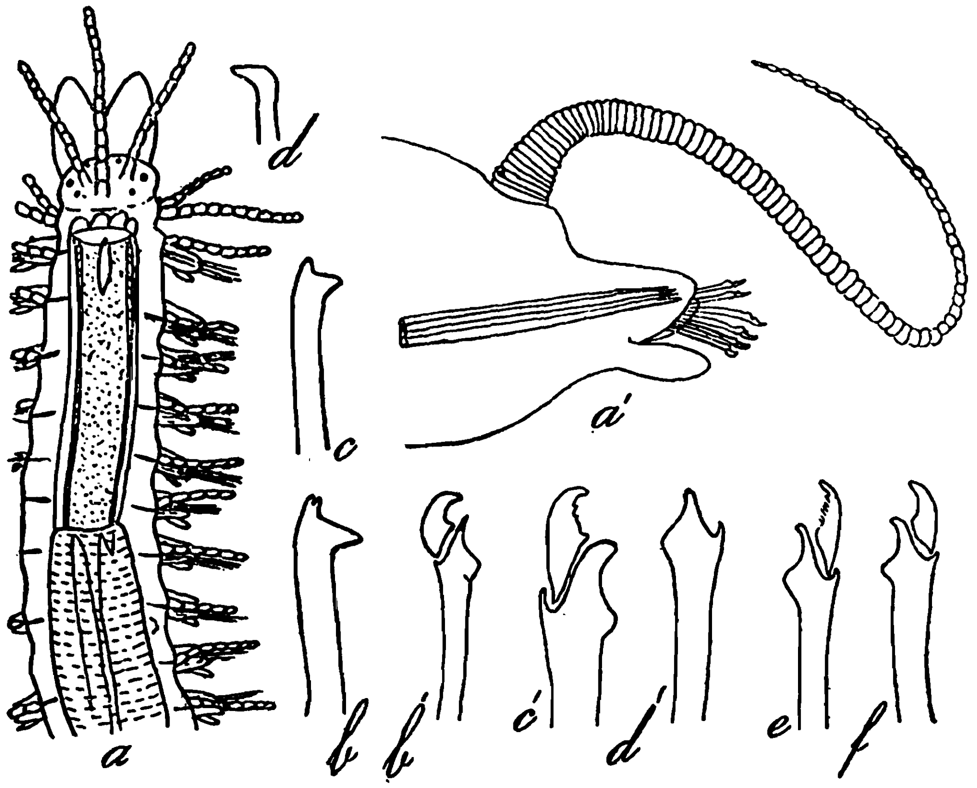


Fig. 75.—*Syllis* (*Haplosyllis*) *spongicola* Grube: *a*, anterior part (after Claparède); *b*, *c*, simple bristles ×272; *d*, aciculum ×272. *S.* (*Typosyllis*) exilis Gravier: a', foot ×47; b', inferior unidentate bristle ×272; c', another inferior bristle ×428; *d'*, *e*, *f*, three ventral bristles from one foot; upper, median, and lower ×272.

Body stout, convex dorsally. A well marked cephalic hood. Pharynx with a large anterior tooth. Dorsal cirri long and slender, with very numerous short articles. The shafts of the lower setae of the anterior feet are noticeably

swollen and the terminal piece is a large, bent, simple, hook. The terminal pieces of the upper setae are more elongated and have an accessory process. The dorsal cirri are inserted high above the feet and alternate, as in *Eusyllis ceylonica* Augener, but the cirri are articulate and the setae different. In general appearance it looks like an *Eusyllis.*

Length: About 20–30 mm.

Occurrence: South Point, Andaman Islands; Madras coast; Maldive Archipelago.

Distribution: Japan; Australia; New Zealand; New Caledonia; Gambier Islands; Indo-China; Arabian Sea; Gulf of Oman; Red Sea.

134. Syllis (Typosyllis) okadai Fauvel. (Fig. 76)

Syllis okadai, Fauvel, 1934, p. 307, figs. 1–2; 1939, p. 292.

Body broad, flattened. Prostomium with four large eyes. Palps long, not fused. Median tentacle longer than the lateral ones, which are slightly longer than the palps. Pharynx with anterior tooth. Anterior dorsal cirri

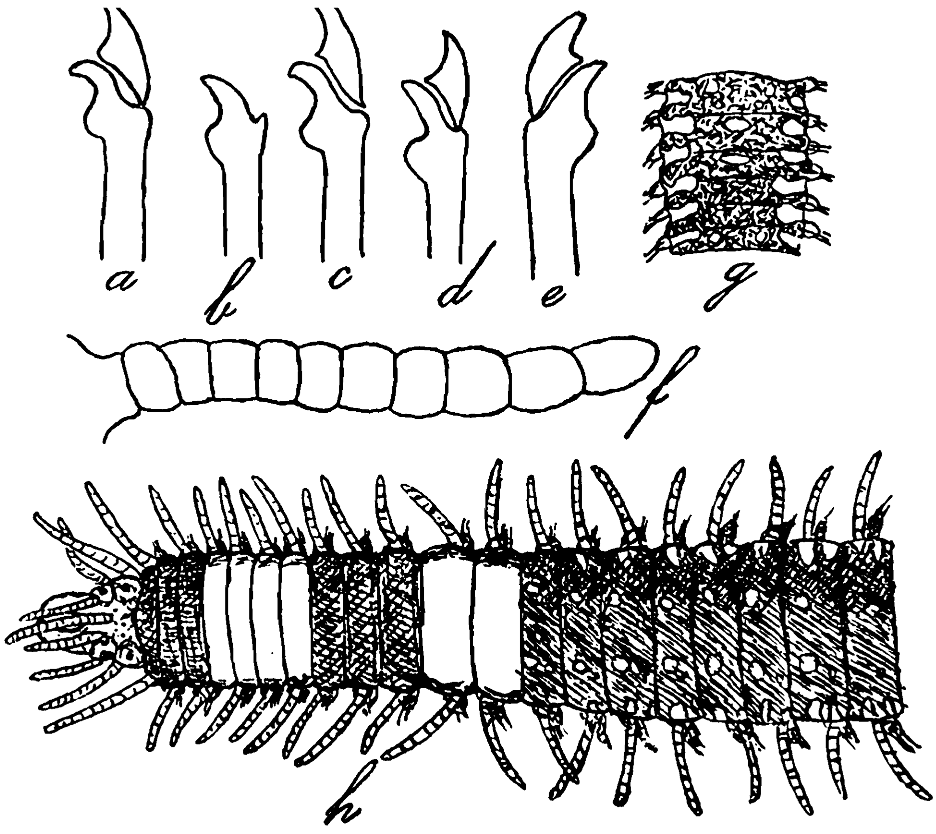


Fig. 76.—*Syllis* (*Typosyllis*) *okadai* Fauvel: *a-e,* sickle-shaped bristles ×438; *f,* dorsal cirrus ×175; *g,* segments from mid-body, dorsal view ×10 *h,* anterior part, enlarged.

thick, cylindrical, blunt, with numerous short and close articles, the following ones more slender, with 10—15 articles, about as long as half the breadth of the body. Feet short, thick; ventral cirri finger-like. Shafts of the setae swollen and curved at the tip; falciform end-pieces short, curved, unidentate. On the last segments a long simple seta, straight or slightly curved.

Length: 19—20 mm. by 1 mm.

Colour: Palps and prostomium dark, first and second segments dark-violet, next four segments white, then three dark-violet and two brownish; next, the back is brown with two longitudinal rows of clear spots. The second white collar sometimes absent.

Occurrence: Corbyn's Cove, Andaman Islands.

Distribution: Seto, Japan; Ream, Gulf of Siam; Andaman Islands.

135. **Syllis (Ehlersia) cornuta** Rathke. (Fig. 79, *g*—*i*).

Syllis (Ehlersia) cornuta, Fauvel, 1923a, p. 267. fig. 100; 1930, p. 14.

Ehlersia sexoculata, Langerhans, 1879, p. 537: Saint Joseph, 1905, p. 181.

Body slender. Anterior tentacles slender, subequal. Pharynx very long, with an anterior tooth; proventriculus long. Dorsal cirri long and slender with about 12—20 articles. Compound setae of two kinds: (1) with a very long and very slender, slightly pectinate and bidentate terminal piece, (2) falcigerous with a short, spinous, bidentate end-piece. Both kinds present in the same feet. On the last segments, a dorsal and a ventral simple seta.

Length: 10—15 mm.

Uncoloured, in spirit.

Occurrence: Gulf of Mannar, Krusadai Island.

Distribution: Indo-China; India; Arabian Sea; Persian Gulf; Atlantic Ocean; Mediterranean Sea.

Genus OPISTHOSYLLIS Langerhans.

Tentacle and cirri articulated. *Tooth in the proximal part of the pharynx*. A flap-like process, or hood, on the posterior part of the head.

Key to the species of Opisthosyllis.

1. Body covered with papillae	..	*australis* Augener, p. 156.
Body without papillae		2
2. Setae unidentate	..	*brunnea* Langerhans, p. 155.
Setae bidentate	..	*longicirrata* Monro, p. 154.

136. Opisthosyllis longicirrata Monro. (Fig. 77, *f—i*)

Opisthosyllis longicirrata, Monro, 1939, p 389, fig. 300.

Head more or less bilobed, grooved posteriorly. Two pairs of eyes, set in a rectangle. A large nuchal flap (hood). Median tentacle about three times as long as the palps and with 50—60 articles. Pharynx long, with

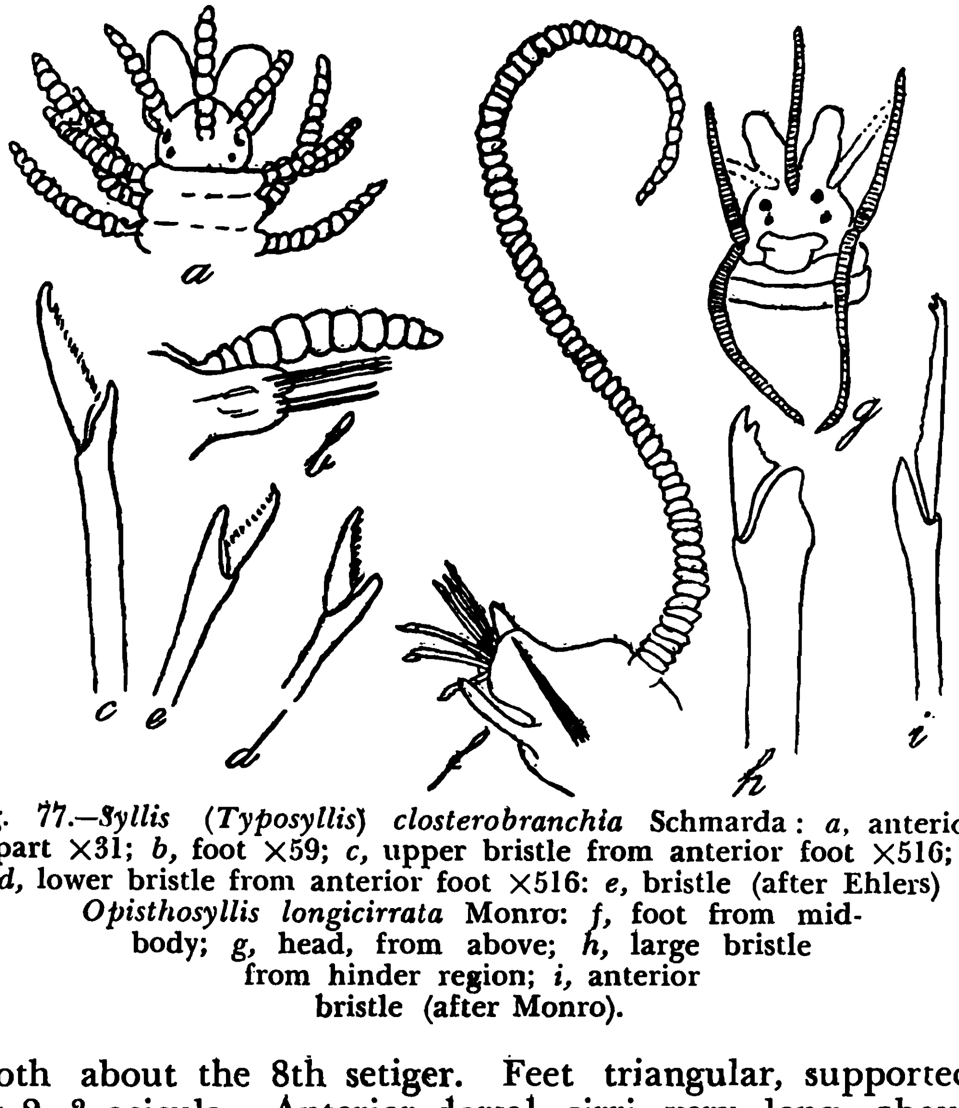


Fig. 77.—*Syllis* (*Typosyllis*) *closterobranchia* Schmarda: *a*, anterior part ×31; *b*, foot ×59; *c*, upper bristle from anterior foot ×516; *d*, lower bristle from anterior foot ×516: *e*, bristle (after Ehlers) *Opisthosyllis longicirrata* Monro: *f*, foot from mid-body; *g*, head, from above; *h*, large bristle from hinder region; *i*, anterior bristle (after Monro).

tooth about the 8th setiger. Feet triangular, supported by 2—3 acicula. Anterior dorsal cirri very long, about 190 articles; shorter behind. Back-feet ending in a pair of small papilliform processes. Ventral cirri short. *All bristles clearly bidentate,* with blades slender and elongate, in the first region, shorter and broader backwards. In the posterior feet, 2—3 setae larger than the rest. *There is no papillation on the body.*

Length: 19 mm. by 1 mm.

Occurrence: Hululu, Male Atoll, Maldive Archipelago.

Distribution: Tahiti; Maldive Archipelago; Red Sea, Suez.

137. **Opisthosyllis brunnea** Langerhans. (Fig. 78, *a—k*).

Opisthosyllis brunnea, Langerhans, 1879, p. 541, pl. XXXI, fig. F: Augener, 1916, p. 274, fig. XXV: Fauvel, 1930, p. 15, fig. 2.

Palps elongated. Pharynx extending through about 11 segments, with an anterior crown of papillae and, at its back part, a large conical tooth inserted on a kind of

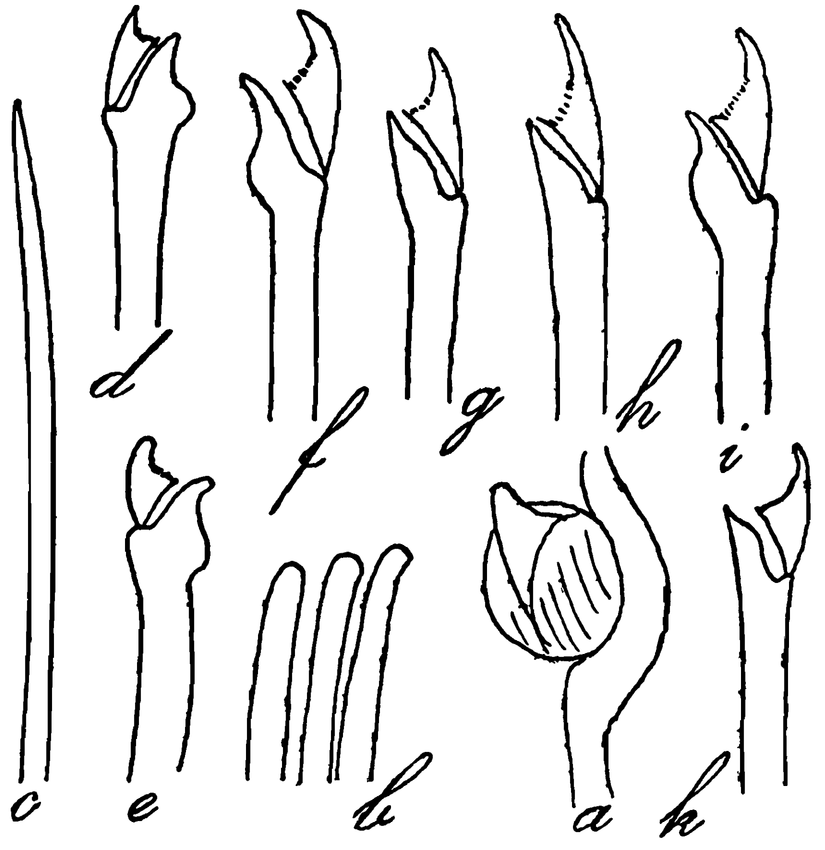


Fig. 78.—*Opisthosyllis brunnea* Langerhans: *a*, tooth in pharynx ×60; *b*, acicular bristles of the stolon ×225; *c*, posterior simple bristle ×225; *d*, *e*, *f*, posterior falcigerous bristles ×225; *g*, *h*, anterior falcigerous bristles ×225; *i*, *k*, falcigerous bristles from mid-body ×225.

round bulb. Proventriculus from the 17th to the 28th setigerous segment. Dorsal cirri with 30—50 articles. Ventral cirri finger-shaped. *Parapodia without papillae.* The shaft of the setae is much swollen distally and bears a simple appendix, gradually shortening posteriorly, and

unidentate. On the last segments a simple seta and 3—4 large acicula. Stolon with long, slender, swimming setae.

Length: 40 mm. by 1 mm.

Occurrence: Gulf of Mannar, Krusadai Island.

Distribution: Indian Ocean; Atlantic Ocean, Madeira; Tropical coast of Africa.

138. **Opisthosyllis australis** Augener. (Fig. 80, *g—i*)

Opisthosyllis australis, Augener, 1913, p. 218, pl. XXVIII, fig. 35: Fauvel, 1923b, p. 13; 1930, p. 518.

Body plump, rounded dorsally, covered with small globular papillae. A well marked nuchal flap (hood) Pharynx with a posterior tooth in the 13th segment. Prostomium oval. Two pairs of eyes. Dorsal cirri long, with 38—40 articles. Ventral cirri finger-shaped. Parapodia with small globular papillae. Falciform end-pieces of the setae rather long and bidentate in the anterior feet; they become shorter and unidentate posteriorly and are mixed with stout simple setae in the median and posterior regions.

Length: 18—20 mm.

Occurrence: Ceylon.

Distribution: Australia; Gambier Islands; New Caledonia; India; Ceylon.

Genus TRYPANOSYLLIS Claparède.

Body flat, ribbon-like. Palps well apart. Proboscis with a circular crown of small teeth (trepan) and a single conical dorsal tooth. Tentacles and cirri long, distinctly articulated. Ventral cirri lanceolate. Bristles with rather large sickle-shaped terminal piece.

Key to the species of Trypanosyllis.

1. Tail with a cluster of stolon buds ..	*misakiensis* Izuka, p. 158.
Tail without a cluster of buds	2
2. Body very large and flat. Dorsum not conspicuously streaked	*gigantea* (McIntosh), p. 158.
Body smaller. Dorsum streaked with conspicuous violet transverse bands ..	*zebra* Grube, p. 157.

139. Trypanosyllis zebra Grube. (Fig. 79, *a—d*)

Trypanosyllis zebra, Fauvel, 1923a, p. 269, fig. 101; 1930a, p. 15; 1932, p. 78: Pruvot, 1930, p. 35: Monro, 1937, p. 273.

Trypanosyllis richardi, Gravier, 1900, p. 68, pl. 9, figs. 12—13.

Body flattened, dorsum somewhat rounded anteriorly. Segments short and numerous. Prostomium broader than long. Dorsal cirri alternately long and short, distinctly articulated. Terminal pieces of the setae bifid and spinous on the edge.

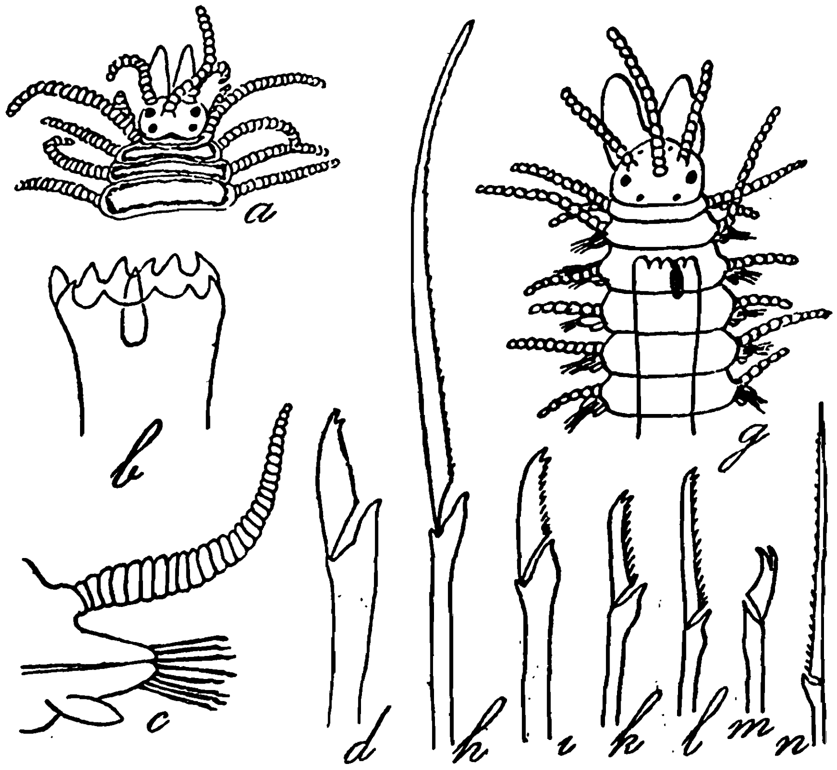


Fig. 79.—*Trypanosyllis zebra* Grube: *a*, anterior part ×17; (after Claparède); *b*, trepan (after Langerhans); *c*, foot, *d*, compound bristle ×437. *Syllis* (*Ehlersia*) *cornuta* Rathke: *g*, anterior part, enlarged; *h, i*, compound bristles ×350. *S.* (*Ehlersia*) *ferrugina* Langerhans; *k-n*, bristles.

Length: 30—60 mm.

Colour: Anteriorly the dorsum is banded with violet-brown bars, two on each segment. Dorsal cirri white, or, often, violaceous or lilac.

Occurrence: Mergui Archipelago; Andaman Islands; Ceylon; Krusadai Island; Gulf of Mannar; Tuticorin; Madras coast; Persian Gulf.

Distribution: Pacific Ocean, Japan, China Sea, Annam; Indian Ocean; Atlantic Ocean; Mediterranean Sea.

140. Trypanosyllis gigantea (McIntosh). (Fig. 80, (*e–f*)

Trypanosyllis gigantea, Fauvel, 1914b, p. 105, pl. VII, figs. 14–15; 1917, p. 200 (Synonymy); 1919, p. 355; 1932, p. 78: Augener, 1924, p. 371; 1927, p. 151: Benham, 1927; p. 56.

Syllis gigantea, McIntosh, 1885, p. 193, pl. XXX, figs. 1–3, pl. XXXIII, fig. 4, pl. XVa, fig. 14, pl. XXIVa, fig. 7.

Differs from *T. zebra* in: (1) its larger size; (2) absence of, or if present only very faint, transverse pigmented streaks on the dorsum and (3) the treminal pieces of the bristle being simple hooks.

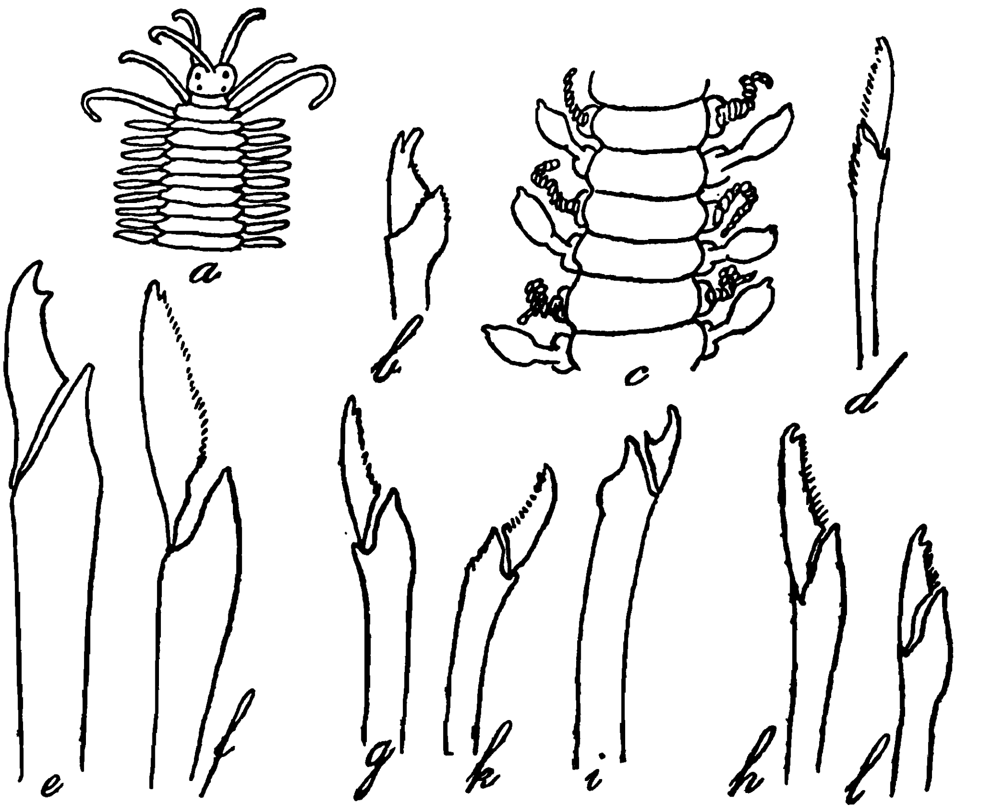


Fig. 80.—*Autolytus orientalis* Willey: *a,* anterior part ×7; *b,* bristle, much enlarged (after Willey). *Parasphaerosyllis indica* (Monro); *c,* middle region from above; *d,* bristle (after Monro); *Trypanosyllis gigantea* (McIntosh); *e, f,* bristles. *Opisthosyllis australis* Augener; *g,* anterior upper bristle ×320; *k,* inferior bristle ×320; *i,* bristle from mid-body ×320. *Eusyllis ceylonica* Augener: *h, l,* superior and inferior bristles from 25th foot ×660 (after Augener).

Length: 80–90 mm. by 5–7 mm.

Occurrence: Nankauri Harbour, Nicobar Islands.

Distribution: South Pacific; Indian Ocean.

141. Trypanosyllis misakiensis Izuka.

Trypanosyllis misakiensis, Izuka, 1912, p. 185, pl. XX, figs. 2–6. Fauvel, 1932, p. 78: Monro, 1939, p. 391.

Body elongate, depressed; dorsum slightly convex. Segments short and numerous. Prostomium bilobed. All the three tentacles equal. Dorsal cirri annulated, borne on a prominent cirrophore. Bristles stout, falcate, the end-piece bifid, with a basal spur (3 teeth according to Izuka) The posterior extremity of the worm is capable of producing successive crops of collateral sexual buds showing an external structure similar to that of the mother individual.

Length: 22 mm. by 2 mm. with 130 segments.

Colour: In spirit, uniformly milk-white.

Occurrence: Madras Coast.

Distribution: Japan; Madras Coast.

Subfamily *EUSYLLINAE.*

Genus EUSYLLIS Malmgren.

Palps fused at the base. Three tentacles. Two pairs of tentacular cirri. Opening of the proboscis crowned with a row of soft papillae and a chitinous denticulated ring, and an anterior tooth. Tentacles and cirri smooth or more or less distinctly pseudo-articulate when contracted. Compound falciform setae.

142. **Eusyllis ceylonica** Augener. (Fig. 80, *h, l*)

Eusyllis ceylonica, Augener, 1926, p. 453, fig. IV: Fauvel, 1930, p. 519.

(??) *Typosyllis taprobanensis,* Willey, 1905, p. 268, pl. III, figs. 77 —78.

Body short, thick, rounded dorsally. Four small eyes. A well marked occipital prominence. Pharynx with a chitinous ring, smooth or faintly denticulate, and an anterior tooth. Tentacles sub-equal. Dorsal cirri alternately long and short, more or less pseudo-articulate: the longer ones inserted on the sides much more above the feet than the shorter ones. The falciform end-pieces of the upper setae longer than those of the lower setae; both are conspicuously bidentate.

Length: 20—30 mm. by 2 mm.

Colour: Reddish-yellow, or with two brown transverse bands on each segment.

Occurrence: Ceylon.

Distribution: New Caledonia; Ceylon.

Genus ODONTOSYLLIS Claparède.

Palps fused at the base. Tentacles and cirri not distinctly articulate. A flap-like process, or hood, on the posterior part of the head. A transverse row of large teeth, pointing backwards, inserted on the anterior edge of the pharynx.

143. Odontosyllis gravelyi Fauvel. (Figs. 81, *a–i*; 82)

Odontosyllis gravelyi, Fauvel, 1930, p. 16, figs. 3–4.
Syllis sp. Gravely, 1927, p. 8.

Body long, thick, rounded dorsally, very brittle; 80–150 segments. Prostomium sub-rectangular. Four large eyes set in a trapezium. Three tentacles, the median

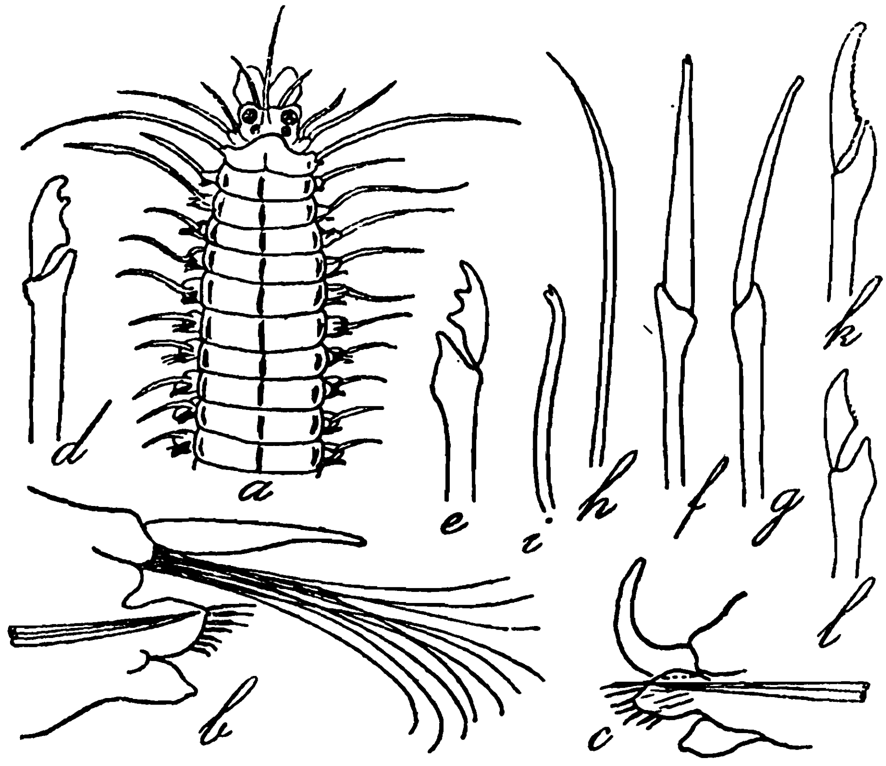


Fig. 81.—*Odontosyllis gravelyi* Fauvel: *a*, anterior part ×10; *b*, foot with swimming bristles ×50; *c*, anterior foot ×50; *d*, *e*, bristles with short bidentate end-piece ×330; *f*, *g*, bristle with long end-piece ×330; *h*, simple posterior seta ×330; *i*, simple bidentate posterior seta ×330. *O. rubrofasciata* (Grube): *k*, *l*, two falcigerous setae from one posterior foot ×400.

twice as long as the laterals. Two broad palps. Proboscis with 6–7 large pharyngeal teeth pointing backwards and two large lateral folds. Pharynx extending from the 4th–5th segments to the 10th. Proventriculus twice as long. A rounded flap over the prostomium. Two pairs of long, unequal, tentacular cirri. Dorsal cirri unjointed,

rapidly decreasing in length, about as long as half the body's breadth. Ventral cirri broad and short. Compound setae of two kinds in every foot; the upper ones with a long needle- or awl-like terminal piece, slightly flattened, very indistinctly bifid and bulbous at the tip; the lower ones much more numerous, with an enlarged shaft and a short bidentate appendix. On the last segments, a small dorsal simple seta, slightly bent, and a ventral simple bifid seta. Mature specimens with long swimming bristles. Two long anal cirri. Phosphorescent.

Fig. 82.—*Opisthosyllis gravelyi* Fauvel: *a,* section of anterior part ×45; *b,* armature of the proboscis ×45.

Length: 15—30 mm. by 1.5—2 mm.

Colour: Yellowish white with a longitudinal dark-brown dorsal streak running the whole length of the body. On a variable number of anterior segments, a brown dorsal spot at the base of the feet. Swarming in May and September, a few days after the new moon.

Occurrence: Gulf of Mannar, anchorage at Krusadai Island and off the end of Sandy Point.

Subfamily *EXOGONINAE*.

Genus PARASPHAEROSYLLIS Monro.

Dorsal cirri alternately short, bulbous and slender, moniliform. Palps fused at the base.

144. **Parasphaerosyllis indica** Monro (Fig. 80, *c–d*)

Parasphaerosyllis indica, Monro, 1937, p. 273, fig. 8: Fauvel, 1939, p. 298.

Body slender and thread-like. Head broader than long, with two pairs of eyes, arranged in a trapezium. Palps fused at the base only. Pharynx with an anterior tooth. Proventriculus short. Tentacles and the first 15 dorsal cirri moniliform, with about 15 articles. Two pairs of tentacular cirri. From the 16th setigerous segment to the end of the stock large bulbous fusiform cirri, with a small terminal knob, alternate with slender moniliform cirri. The setae are slender, with a straight end-piece, faintly bidentate at the tip. The beginning of the stolon is marked by two pairs of eyes.

Length: 8–11 mm. by 0.5 mm.

There is no colour.

Occurrence: Arabian coast.

Distribution: Arabian Sea, Cauda, Annam.

Remarks: Monro places this species among the *Exogoninae*, which apears unlikely because of its palps fused at the base only and its moniliform cirri.

Subfamily *AUTOLYTINAE*.

Genus AUTOLYTUS Grube.

Ventral cirri absent. Palps little developed, attached to the ventral surface of the cephalic lobes. Cirri unarticulate, filiform, present on every segment. Proboscis sinuous, with a crown of small teeth. Proventriculus ovoid. Falcate bristles with short bifid tips. Sexual generation shows dissimilar males and females (*Polybostrichus* and *Sacconereis*.)

145. **Autolytus orientalis** Willey. (Fig. 80, *a, b*).

Autolytus orientalis, Willey, 1905, p. 270, pl. IV, figs. 80–84: Augener, 1926b, p. 454, fig. 5: Fauvel, 1932, p. 80.

About " 30 setigerous segments in the anterior or parent individual. The parapodia contain two acicula and numerous, upwards of 20, compound falcigerous setae; the head of the shaft is laciniate and the appendix is minutely bidentate and minutely fringed. The dorsal

cirri are rather short, lanceolate, petaloid, with strong basal articulation. The second dorsal cirrus, *i.e.*, the cirrus of the first setiger, is the longest. The rounded reduced palps, joined together in the middle line along their own length, are only visible from below. The pharynx is long and has a sigmoid flexure; it is armed in front with a circle of 44 denticles, larger and smaller irregularly alternating. The proventriculus shows 28 glandular rows." (Willey.)

In both specimens from Chandipore the parent stock has about 30 setigerous segments. One bears a single stolon and the other two. Augener has figured the free swimming male stolon or *Polybostrichus.*

Occurrence: Ceylon; Orissa, Chandipore, near Balasore; taken at low tide on Chaetopterid tubes.

Incertae sedis.

146. **Cirosyllis zealanica, Schmarda,** 1861, p. 78.

147. **Pionosyllis** spec., **Fauvel,** 1930, p. 16. Krusadai Island.

148. **Exogone** spec., **Augener,** 1926, p. 455. Trincomalee, Ceylon.

149. **Sacconereis** spec., **Fauvel,** 1932, p. 80. Andaman Islands: in plankton.

Family NEREIDAE Johnston. (Fig. 83).

Body elongated, rounded or somewhat flattened. Prostomium with four eyes. Two subulate tentacles. Two massive two-joint palps. Four pairs of tentacular cirri. Proboscis armed with a pair of horny jaws and, generally, a series of horny teeth (paragnaths) which may be arranged in eight groups. Feet biramous (except in *Lycastis*) after the second foot. Dorsal and ventral cirri. Dorsal ramus with 2–3 lobes or ligules, ventral ramus with two fillets and one lobe. Setae compound, spinigerous and falcigerous. Generally an epitokous, *Heteronereis,* mature form.

Remarks: The chief characters used for the identification of Nereids are, first, those of the proboscis, next of the feet and, last, of the setae. The everted proboscis is armed, at its opening, with two lateral, horny, falciform jaws, more or less denticulate. The trunk is divided into two rings, an anterior distal, or maxillary ring, and an inferior, proximal, basal or oral ring. It is

divided into twelve areas on which are inserted the groups of horny denticles, or paragnaths. These areas are designated by Roman numerals as follows: *Maxillary ring,* dorsal median group I; two dorso-laterals II; ventral median III; two ventro-laterals IV; *Oral ring,* median dorsal V; two dorso-laterals VI; median ventral VII; two ventro-laterals VIII.

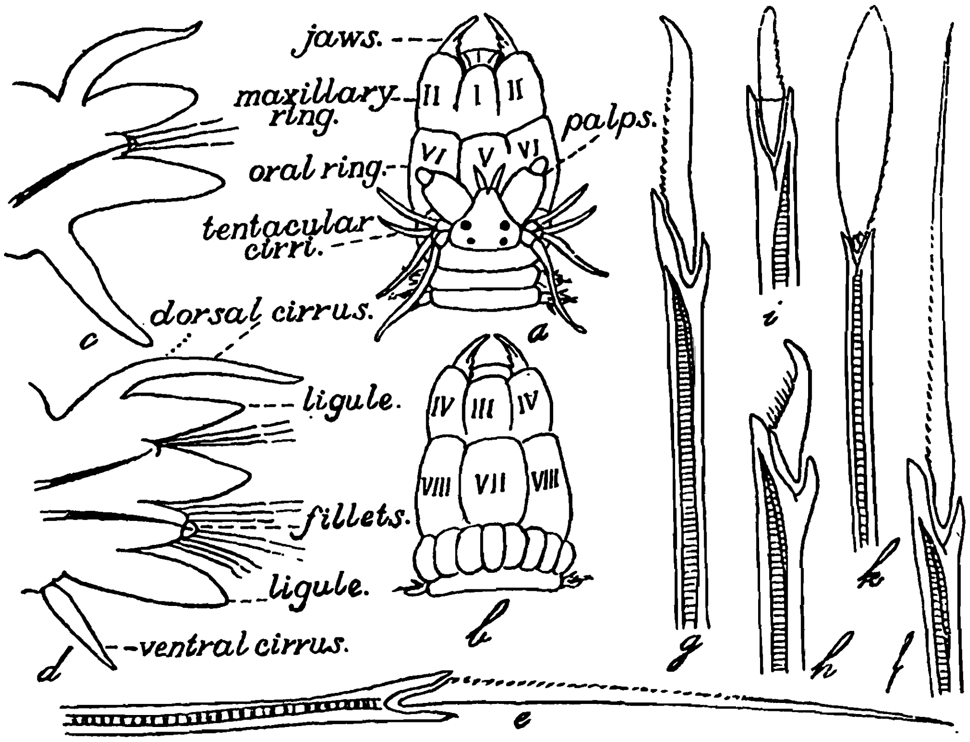


Fig. 83.—*Nereidae*: *a, b,* head with proboscis extruded showing the numbers of the groups of paragnaths; *c,* first foot (uniramous); *d,* average foot from mid-body (biramous); *e,* homogomph spiniger (or aristate) bristle ; *f,* heterogomph spiniger; *g,* long heterogomph falciger; *h,* short heterogomph falciger; *i,* dorsal homogomph falciger; *k,* swimming bristle of *Heteronereis* stage.

Parapodia: Those of the first two segments are uniramous, all the others biramous. Each ramus is supported by a strong, enclosed, aciculum and bears 2—3 more or less flattened lobes, the size and form of which may vary materially and gradually from before backwards. The last ones are sometimes highly modified and then afford important features for identification. Consequently it is always advisable to examine carefully anterior, middle and posterior feet of any specimen.

The setae more rarely afford specific distinctions. Typically, in a Nereid's foot, there is a dorsal bundle of homogomph, spinigerous setae, a ventral upper bundle of homogomph spinigerous and heterogomph falcigerous setae and a lower bundle of heterogomph spinigerous and

heterogomph falcigerous setae. Moreover, in some species, there is an homogomph falcigerous seta in the dorsal ramus. Large simple ventral setae or hooks are uncommon.

Key to the genera of NEREIDAE.

1. Branched gills on some of the anterior segments. Paragnaths absent	2
No branched gills	3
2. Branchial filaments situated below the dorsal cirrus	*Dendronereides* Southern, p. 173.
Branchial filaments inserted on the dorsal cirrus	*Dendronereis* Peters, p. 172.
3. Paragnaths absent	4
With soft paragnaths only	6
With both soft and horny paragnaths	*Leonnates* Kinberg, p. 169.
With separate conical horny paragnaths only (*Nereis*)	8
With separate conical and transverse paragnaths, or arranged in transverse lines in group VI	9
Horny paragnaths of three forms: conical, transverse and pectinate	*Pseudonereis* Kinberg, p. 215.
4. Feet uniramous	*Lycastis* Savigny, p. 166.
Feet biramous ..	5
5. Buccal segment with feet and setae	*Micronereis* Claparède.
Buccal segment without feet or setae	*Leptonereis* Kinberg.
6. Eyes absent, neuropodium with well developed ventral ligule and setigerous lobe; ventral cirri double, the two parts arising from a common base	*Ceratocephala* Malmgren.
Eyes present; neuropodium and ventral cirrus normal	7
7. Dorsal ligule of neuropodium absent; setae of the usual three kinds	*Tylorhynchus Grube*.
Dorsal ligule foliaceous, all setae homogomph spinigerous	*Tylonereis* Fauvel, p. 168.
8. All groups of paragnaths complete ..	*Nereis* Cuvier, p. 175.
Sub-genus	*Neanthes* Kinberg, p. 193.
The mid-dorsal and, sometimes, the dorsal-lateral groups missing on the proximal ring	*Nereis*, s. str., p. 177.

All dorsal groups missing except the dorso-laterals of the proximal ring	*Nereis,* subgenus *Cirronereis.*
All groups, both dorsal and ventral, missing on the proximal ring	*Nereis,* subgenus *Ceratonereis,* p. 194.
The dorso-laterals alone present on the proximal ring, none on the distal	*Nereis,* subgenus *Eunereis*
9. All groups complete	*Perinereis* Kinberg, p. 202.
The mid-dorsal missing on the proximal ring	*Arete* Kinberg.
10. The mid-dorsal missing on the distal ring	*Pisenoë* Kinberg.
All dorsal groups missing on the distal ring and at least the mid-dorsal (sometimes all both dorsal and ventral) on the proximal ring	*Platynereis* Kinberg, p. 217.

Genus LYCASTIS Savigny.

All feet uniramous. Proboscis without paragnaths.

Key to the species of Lycastis.

Dorsal setae numerous. Dorsal cirri broad and flattened	*meraukensis* Horst, p. 166.
Dorsal setae rare or missing. Dorsal cirri more elongated and rather narrow ..	*indica* Southern, p. 167.

150. Lycastis meraukensis Horst. (Fig. 85, *b*).

Lycastis meraukensis, Horst, 1918, p. 246. Fauvel, 1932, p. 82.

Head broader than long, rounded, trapezoidal, provided with a median longitudinal groove. Eyes situated laterally in the posterior margin of the head; the external of each pair is the larger and is placed somewhat more anteriorly than the internal. Antennae short, conical. Palps with a stout basal part and a small, papilliform, distal joint. Maxillae short and stout. The longest tentacular cirrus reaches to the 2nd or 3rd segment. Dorsal cirri enlarged and flattened, leaf-like, overlying each other (in small specimens they are slender and pointed) A fascicle of 8—10 dorsal slender setose bristles (missing in the posterior body region) Neuropodium cylindrical, with heterogomph spinigerous and falcigerous bristles, the terminal piece of which is rather short and broad and ciliated.

Length: 150—200 mm. by 20—22 mm.

Occurrence: Bangkok, Siam; Mergui.
Distribution: New Guinea; Bangkok; Mergui.

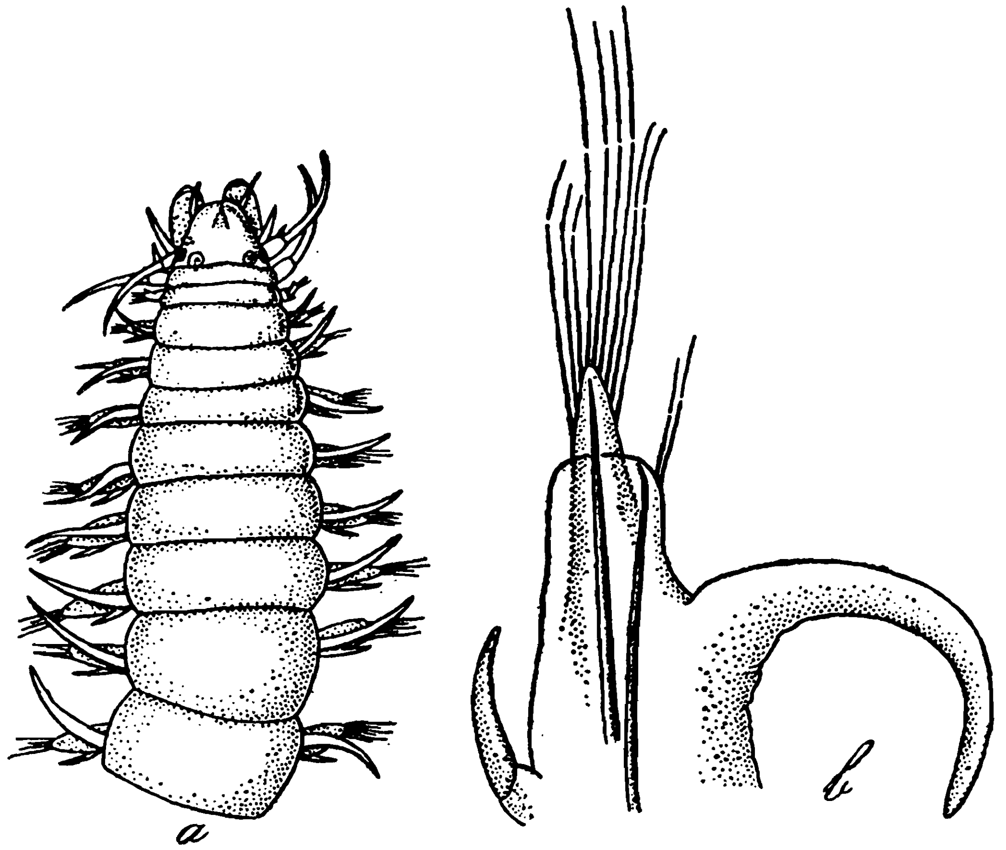


Fig. 84.—*Lycastis indica* Southern: *a*, anterior end, dorsal view ×15; *b*, foot of a specimen with dorsal bristles and narrow dorsal cirrus ×70.

151. Lycastis indica Southern. (Fig. 84, *a*, *b*; 85, *a*)

Lycastis indica, Southern, 1921, p. 578, pl. XIX, fig. 2: Horst, 1924, p. 4: Fauvel, 1932, p. 82, pl. II, figs. 1—2.

Longitudinal groove of the head ending in a pit; eyes situated more or less in a line and provided with lenses. Dorsal cirri rather narrow, length and breadth varying materially: they are very long and recurved on the back in the posterior region. Dorsal setae missing or very few, 1—2, rarely more. Terminal piece of the falcate setae long and narrow, but thick. Hemigomph and heterogomph spinigerous setae.

Length: 12—150 mm. by 2—5 mm.

Colour: Reddish-brown pigment in the anterior part of the body, increasing in redness and density towards the tail.

Occurrence: Calcutta waterworks; Salt lakes, Calcutta; Chilka Lake, Madras; brackish waters of India;

Andaman Islands. Euryhaline from fresh water to brackish and sea-water.

Distribution: Macassar; India.

Genus TYLONEREIS Fauvel.

Feet biramous. Dorsal ligule foliaceous. *All setae homogomph spinigerous.* Proboscis with soft papillae, without paragnaths. Prostomium, tentacles, palps and tentacular cirri as in the genus *Nereis* Cuvier.

Key to the species of Tylonereis.

Ventral setigerous lobe trilobed	*bogoyawlenskyi* Fauvel, p. 168.
Ventral setigerous lobe bilobed	*fauveli* Southern, p. 169.

152 **Tylonereis bogoyawlenskyi** Fauvel. (Fig. 85, *e, f*)

Tylonereis bogoyawlenskyi, Fauvel, 1911, p. 373, pl. XIX, figs. 1–7; 1932, p. 83: Gravely, 1927, p. 11, pl. X, figs. 18–19.

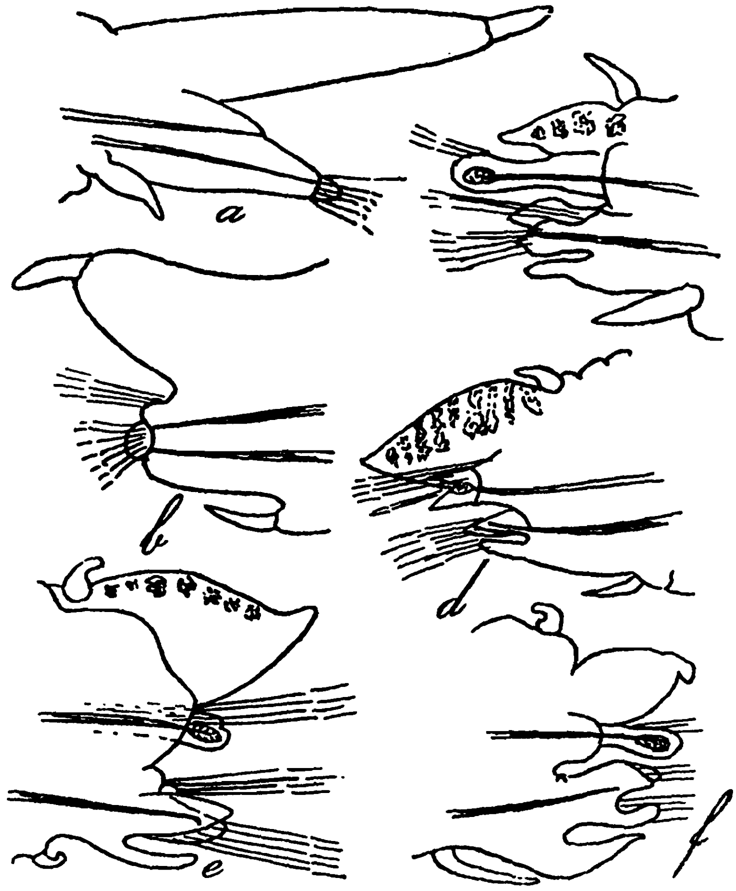


Fig. 85.—*Lycastis indica* Southern: *a*, 70th foot ×100 (after Southern). *L. meraukensis* Horst: *b*, foot, *Tylonereis fauveli* Southern: *c*, 7th foot ×50; *d*, 30th foot ×50 (after Southern). *T bogoyawlenskyi* Fauvel: *e*, foot from mid-body ×35; *f*, 7th foot ×35.

Prostomium broader than long, notched. Tentacles short. Proboscis with conical soft papillae, groups: I=0 or 3; II=0 or 1; III=8–10; IV=a group of 4–5 on

each side; V = 0; VI = one papilla on each side; VII = 2 on each side; VIII = 0, or a row of depressed lobes. Feet biramous. Setae long homogomph spinigers, all alike. Dorsal and ventral cirri very small. Dorsal ligule triangular, foliaceous. Dorsal fillet (setigerous lobe) elongated, expanded at the tip in the anterior segments, bifid in the posterior ones. Ventral setigerous lobe at first trilobed, but bilobed in posterior feet. Ventral lower ligule decreasing in size backwards. A pair of anal cirri. Burrows in sand or mud.

Length: About 60 mm. by 4 mm., feet included.

Colour: In life, of a bright pink colour, with a transverse brown line on each segment at the anterior end and a dark-red mid-dorsal line.

Occurrence: Krusadai Island, Tuticorin beach, Kilakarai, Pamban backwater; Neendakara Bar and Veli Lake, Travancore.

Distribution: Gulf of Mannar; Travancore; Persian Gulf.

153. Tylonereis fauveli Southern. (Fig. 85, *c—d*)

Tylonereis fauveli, Southern, 1921, p. 582, pl. XIX, fig. 3: Fauvel, 1930a, p. 19; 1932, p. 84.

Differs from *T bogoyawlenskyi* only in having the ventral setigerous lobe bilobed, instead of trilobed, in the anterior as well as in the middle and posterior feet. Size rather large.

Occurrence: Mergui; Chilka Lake; Pamban.

Genus LEONNATES Kinberg.

Proboscis with both soft and horny paragnaths. Falcate bristles with a convex denticulated border.

Key to the species of Leonnates.

End-piece of the falcigerous bristles hooked at the tip	*jousseaumei* Gravier, p. 169.
End-piece of the falcigerous bristles enlarged and abruptly truncate at the tip	*decipiens* Fauvel, p. 171.

154. Leonnates jousseaumei Gravier. (Fig. 86, *d—f*)

Leonnates jousseaumei, Gravier, 1901, p. 160, pl. XI, figs. 34—37: Fauvel, 1930a, p. 19, fig. 5; 1932, p. 85: Horst, 1924, p. 150: Monro, 1931, p. 43.

Body stout, a little flattened. Maxillary ring of the proboscis with small horny paragnaths, I = 0 or 1. Oral

ring with soft conical papillae; V=O. Parapodia: dorsal ramus with three elongated ligules and a long dorsal cirrus: Ventral ramus with two lanceolate fillets and a longer ligule. Ventral cirrus subulate. Spinigerous setae all homogomph. Falcate homogomphs with a terminal piece hooked at the tip and boldly serrated on the con-

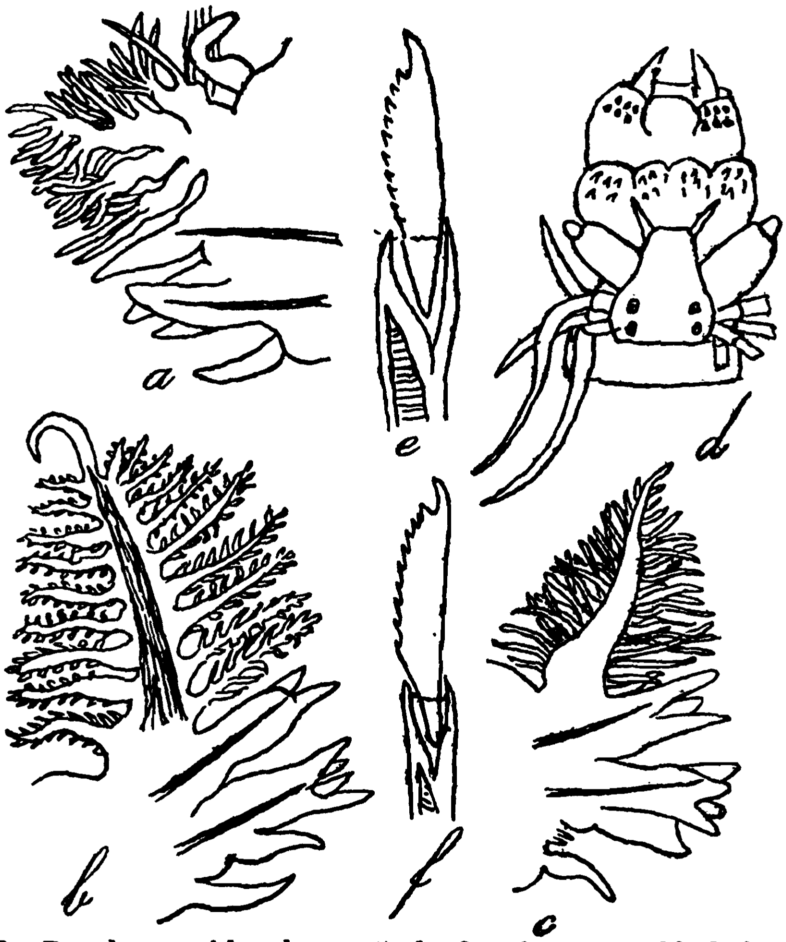


Fig. 86.—*Dendronereides heteropoda* Southern, *a*, 23rd foot ×56. *Dendronereis aestuarina* Southern: *b*, foot ×37. *D. arborifera* Peters: *c*, 16th foot ×37. *Leonnates jousseaumei* Gravier: *d*, head and proboscis, enlarged; *e*, upper ventral falciger from 24th foot ×467; *f*, lower ventral falciger ×467.

vex border. They are present on the first setigerous segments in both the ventral bundles of every foot and on the dorsal ramus of the posterior feet.

Length: 80 mm. by 6 mm.

Colour: Dark-brownish red, with a dark spot at the base of the dorsal rami.

Occurrence: Mergui; Gulf of Mannar; Pambam; Karachi.

Distribution: Macassar Straits; Annam; Bay of Bengal; Arabian Sea; Persian Gulf; Red Sea.

155. Leonnates decipiens Fauvel. (Fig. 87).

Leonnates decipiens, Fauvel, 1929, p. 180; 1930a, p. 20, fig. 5, *f—m.*

Leonnates jousseaumei (*non* Gravier), Fauvel, 1927b, p. 427, fig. 106, *f, g.*

Body stout, a little flattened: 80—90 segments. Prostomium broader than long. Four black eyes. Palps stout, divergent, as long as the tentacles. Longer tentacular cirri reaching backwards to the 4th or 5th segment. Jaws dark, curved, smooth on edge. Maxillary ring with

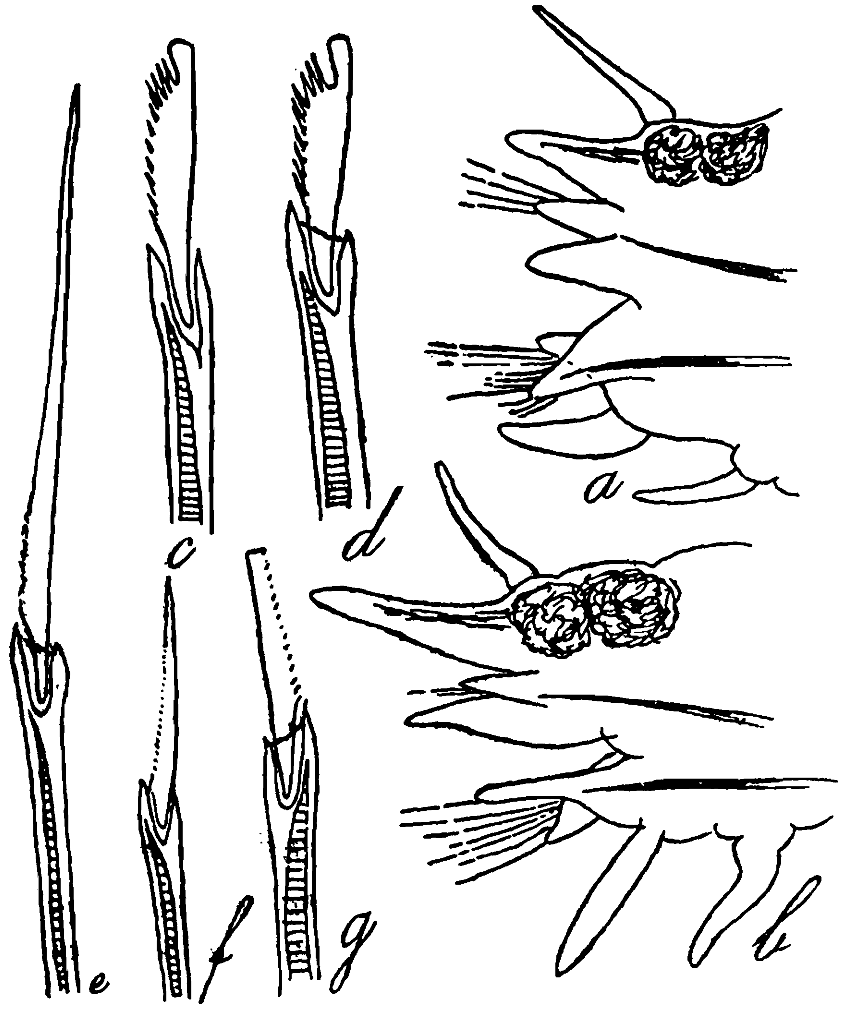


Fig. 87.—*Leonnates decipiens* Fauvel: *a,* foot from mid-body ×30; *b,* posterior foot ×30; *c, d,* falcigers from mid-body ×600; *e, f,* long and short spinigerous bristles ×600; *g,* articulation of heterogomph bristles ×600.

small conical denticles, transparent, hardly visible. I = 0; II = an oblique row; III = a small transverse group; IV = a crescentic group. Oral ring with soft conical papillae. V = 0; VI = a single large papilla on each side; VII—VIII = a single row of 7—8 smaller papillae, sometimes more or less absent. Dorsal ramus with three ligules, the upper triangular, with well marked dark glands;

the two lower ligules subequal, conical, smaller; dorsal cirrus on the base of the superior ligule and a little longer. Ventral ramus with two unequal fillets and a slightly longer, blunt, ligule; ventral cirrus tapering, shorter. In the posterior region, dorsal ramus much longer than the ventral. Dorsal setae all homogomph spinigers. Ventral setae, in the anterior and posterior feet, homogomph and hemigomph spinigers and shorter heterogomph ones. On the middle region from about the 13th and 15th setigerous segment, the ventral heterogomph spinigers are superseded by falcigerous setae the terminal piece of which has a spinous convex edge and an enlarged and abruptly truncated tip. *Even in the posterior feet, there are no dorsal falcigerous setae* and the ventral falcigerous setae are absent, in the anterior and posterior feet, in contradistinction to *jousseaumei* Gravier. Two long anal cirri.

Length: 20–300 mm. by 2 mm.

Colour: Colourless, in spirit.

Occurrence: Gulf of Mannar; Krusadai; Pamban.

Distribution: Gulf of Mannar; Suez Canal.

Genus DENDRONEREIS Peters.

Proboscis with only soft papillae. Prostomium deeply indented in front. *Dorsal cirrus of a number of anterior segments bearing numerous branchial filaments.* Ventral division of the feet multifid in the mid-body segments, more simple in the posterior ones. Setae all homogomph spinigerous.

Key to the species of Dendronereis.

Branchial cirri pinnate ..	***arborifera*** **Peters, p. 172.**
Branchial cirri bipinnate	***aestuarina*** **Southern, p. 173.**

156. Dendronereis arborifera Peters. (Fig. 86, *c*).

Dendronereis arborifera, Ehlers, 1868, p. 578, pl. XXII, figs. 33–42: Fauvel, 1919, p. 399, pl. XV, figs. 5–8; 1932, p. 85.

Prostomium deeply cleft between the diverging tentacles, partly connected with the ovoid palpophores. Four eyes. Proboscis with soft conical papillae on both rings. Dorsal cirri bearing lateral simple branchial filaments from the 8th–10th to the 18th–22nd segment. In the anterior feet, dorsal division with two triangular lobes, ventral division with 4–6 conical lobes and a few papillae.

In the posterior feet, dorsal division bilobed, ventral division with a single large triangular lobe and a small ventral cirrus. Dorsal and ventral setae all homogomph spinigerous, nearly alike.

Occurrence: Vizagapatam backwater and Canal.

Distribution: India; Madagascar; Mozambique.

157. **Dendronereis aestuarina** Southern. (Fig. 86, *b*)

Dendronereis aestuarina, Southern, 1921, p. 598, pl. XX, fig. 4. Fauvel, 1932, p. 86.

Prostomium deeply indented in front, situated between the diverging tentacles and shorter than the tapering palps. Four large eyes. Prosboscis with soft conical papillae on the basal ring. Maxillary ring devoid of papillae. Dorsal cirri bearing lateral pinnate gills, which commence on the 14th—15th foot. In the anterior feet the ventral division has a large number (15—19) of lobes, of which some form a fringe behind the setae. In the posterior feet, the dorsal division is bilobed and the ventral consists of two foliate lobes with a conical lobe between them, the ventral ligule and the ventral cirrus. Setae homogomph with long finely serrated terminal piece, which becomes shorter in the upper division of posterior feet.

Length: 40 mm. by 5 mm.

Occurrence: Gangetic delta (in brackish water); Madras; Travancore.

Distribution: Taleh-Sap (Gulf of Siam); India.

Genus DENDRONEREIDES Southern. (emended)

Proboscis armed only with soft paragnaths. Dorsal setigerous lobe absent in first and second feet. In some of the anterior feet, *gills are present in the form of numerous filaments situated below the dorsal cirrus*: they are provided with vessels. Setae of two kinds, falcate homogomphs and spinose heterogomphs. In all the feet, except the anterior ones, there is a peculiar gland opening to the exterior beneath the dorsal cirrus. *The ventral ligule is absent.* In the post-branchial region the foot is greatly simplified.

158. **Dendronereides heteropoda** Southern. (Fig. 86, *a*; 88).

Dendronereides heteropoda, Southern, 1921, p. 603, text-fig. 10*a*, *b*, pl. XXI, fig. 6, *a*–*n* Fauvel, 1932, p. 87, pl. II, figs. 3–9.

Body long and slender. Prostomium broad, cleft between the small tentacles. Four eyes. Palps blunt, ovoid. Proboscis with a number of papillae on the maxillary ring; on the oral ring: V = 3; VI = 2–3 on each side; VII–VIII = two irregular rows. Anterior feet with dorsal and ventral cirri; 2–3 dorsal ligules and 3–4 ventral lobes.

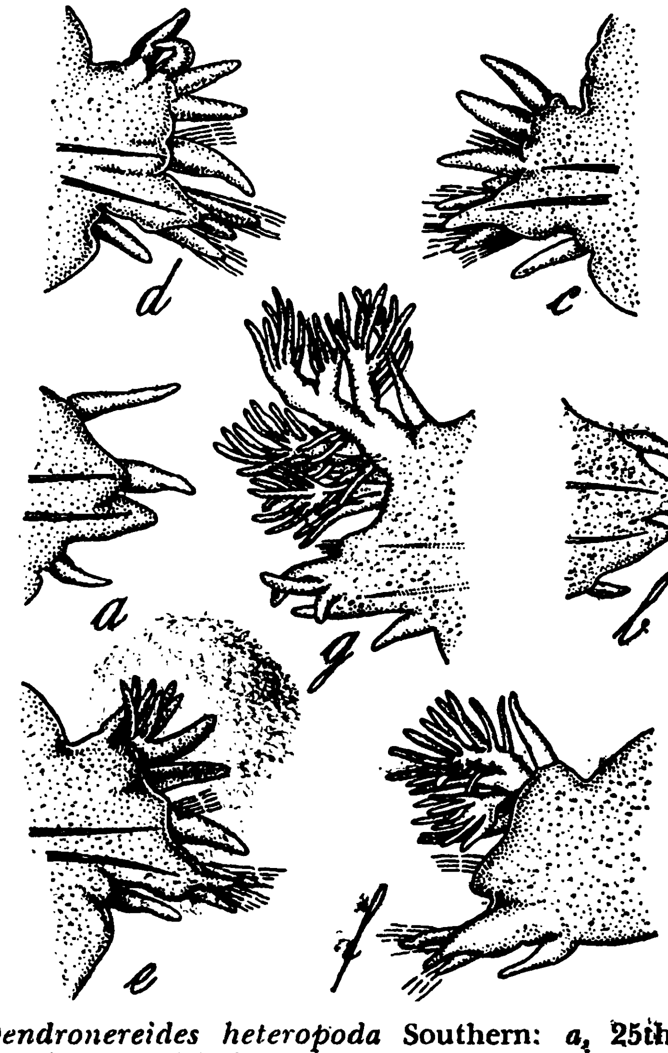


Fig. 88.—*Dendronereides heteropoda* Southern: *a*, 25th foot×28; *b*, 34th foot ×28; *c*, 4th foot ×28; *d*, 8th foot ×28; *e*, 11th foot ×28; *f*, 15th foot ×28; *g*, 18th foot ×28.

Branchial region from 8th to 40th–50th setigerous segments, with clusters of more or less branched bunches of gills *inserted below the dorsal cirrus* and above the dorsal ligule; ventral division trilobed. In the posterior abranchiate feet, dorsal and ventral divisions each reduced to a single lobe. Homogomph spinigerous setae and homogomph

falcate setae with smooth terminal piece. Two large anal cirri.

In epitokous males the gills are more numerous and are present on a greater number of feet. Posteriorly, the feet become longer and more simple. The setae are very numerous, very long and slender. Further back the feet and bristles become shorter again and the body is reduced to an elongated soft, white pouch, swollen with sperm. Pygidium with a few short papillae.

Length: 60–135 mm.

Colour: Anterior region of the body rusty red. At the back of the head a narrow transverse band, or two elongate spots of brown pigment.

Occurrence: Calcutta waterworks, Pulta Tanks; Bombay; Vallarpadan; Barantolla.

Distribution: India; Diamond Isles; Shat-el-Arab.

Genus NEREIS Cuvier.

Body vermiform, numerous segments. Two tentacles. Two ovoid palps. Four eyes. Four pairs of tentacular cirri. Proboscis with two horny, curved jaws and *conical horny paragnaths*. Parapodia biramous, the first two setigerous segments excepted, which are uniramous. Dorsal and ventral cirri. Spinigerous and falcigerous compound setae. Generally an epitocous stage, *Heteronereis*.

Key to the species of Nereis.

1. Basal ring of proboscis with horny paragnaths	2
Basal ring destitute of paragnaths ..	Subgen. *Ceratonereis* 20.
2. All groups of paragnaths present	Subgen. *Neanthes* 3.
Some groups absent ..	Subgen. *Nereis* Cuvier s. str. 4
3. Anterior feet with rounded lobes	*megitti* Monro, p. 194.
Anterior feet with pointed lobes	*capensis* Willey, p. 193.
4. A few simple hooked bristles	5
Simple hooks absent .	6
5. Simple hooks ventral	*anchylochaeta* Horst, p. 177.
Large dorsal simple hooks	*onychophora* Horst, p. 178.
6. Groups of paragnaths of the basal ring disposed in a nearly continuous belt	7
Groups of the basal ring distinct	8

7.	Spinigerous bristles only ..	*chingrighattensis* Fauvel, p. 179.
	Spinigerous and falcigerous bristles	*cricognatha* Ehlers, p. 180.
8.	*Heteronereis* male with 3 regions	*heteromorpha* Horst, p. 193.
	Body not divided into three regions . ..	9
9.	Dorsal homogomph falcigerous, bristles in the posterior feet	16
	Dorsal homogomph falcigerous, bristles absent ..	10
10.	A single row of paragnaths in groups VII—VIII	11
	Several rows of paragnaths in groups VII—VIII	13
11.	Two dorsal flagelliform ligules in the median feet	*longilingulis* Monro, p. 192.
	Dorsal ligules not flagelliform ..	12
12.	Dorsal ligules much reduced	*reducta* Southern, p. 190.
	Dorsal ligules normal ..	*gisserana* Horst, p. 190.
13.	Dorsal division of posterior feet trifid. Falcate terminal pieces elongated. VI=1+1 ..	*glandicincta* Southern, p. 181
	Dorsal division of posterior feet bifid, with diverging ligules. Falcate terminal pieces short. V = a cluster	*unifasciata* Willey, p. 182.
14.	Inferior bilobed dorsal ligule borne on an elongated base. Falcate terminal pieces long. VI = 4—5	*talehsapensis* Fauvel, p. 184.
	Dorsal division normal ..	15
15.	Lobes of posterior feet sharp and diverging. Dorsal division of anterior feet trilobed. Falcate appendages short ..	*chilkaensis* Southern, p. 185.
	Posterior lobes not modified. Falcate appendages curved	*indica* Kinberg, p. 186.
16.	Terminal piece of posterior dorsal homogomph falcigerous bristles smooth ..	17
	Terminal piece of posterior dorsal homogomph falcigerous, bristles boldly bi- or tridentate	18
17.	Dorsal ligule of posterior feet enlarged	*coutierei* Gravier, p. 187.
	Dorsal ligule of posterior feet not enlarged	*trifasciata* Grube, p. 183.
18.	A single row of few paragnaths on groups VII—VIII ..	19

Several rows of paragnaths on groups VII—VIII	*zonata-persica* Fauvel, p. 187.
19. Prostomium notched anteriorly	*kauderni* Fauvel, p. 188.
Prostomium not notched anteriorly	*jacksoni* Kinberg, p. 189.
20. Prostomium deeply cleft	Sub-gen. *Ceratonereis, mirabilis* Kinberg, p. 200.
Prostomium not cleft	21
21. Lobes of the feet ending in long whip-like processes	*flagellites* Fauvel, p. 199.
Lobes of the feet normal ..	22
22. With falcigerous bristles throughout	24
Falcigerous bristles absent in posterior feet ..	23
23. Dorsal ramus with three triangular ligules ..	*burmensis* Monro, p. 196.
Dorsal ramus with two blunt ligules ..	*microcephala* Grube, p. 198.
24. Very large falcigers with end-piece fused with the shaft	*pachychaeta* Fauvel, p. 196.
Falcigerous setae normal	*costae* Grube, p. 194.

Subgenus NEREIS s. str.

Group V, or groups V and I of paragnaths absent.

159. Nereis anchylochaeta Horst. (Fig. 89, *a—e*)

Nereis anchylochaeta, Horst, 1924, p. 155, pl. XXX, figs. 8—9: Fauvel, 1931, p. 20, pl. II, figs. 8—9; 1932, p. 88.

Proboscis: Group I = 3 in a longitudinal line; II = a crescentic row; III = 3 in a line; IV = a few, large, in a line; V=0; VI=0 or 1; VII—VIII = a single row of 2—3. Dorsal ramus of the anterior feet with three sub-equal ligules. In the middle and posterior feet, very large simple hooks in the upper and lower ventral bundle and small compound heterogomph falcigerous bristles. The simple hooks are large falcate bristles whose terminal piece is fused with the shaft. All transitional stages are met with between the clearly compound bristles and the large simple hooks.

Occurrence: Malacca Strait; Nankauri Harbour, amongst corals.

Distribution: Malay Seas; Amboina; Malacca Strait; Annam; Nicobar Islands.

160. Nereis onychophora Horst. (Fig. 89, *f—i*).

Nereis onychophora, Horst, 1918, p. 248; 1924, p. 61, pl. XXI, figs. 12—14: Fauvel, 1932, p. 89.

Nereis caenocirrus, Chamberlin, 1919, p. 269, pl. XXXIII, figs. 7—8, pl. XXXIV, figs. 1—6, pl. XXXV, figs. 1, 2.

Prostomium broad. Two pairs of large eyes. Proboscis: Group I=1—3; II & IV=crescentic clusters; III, a

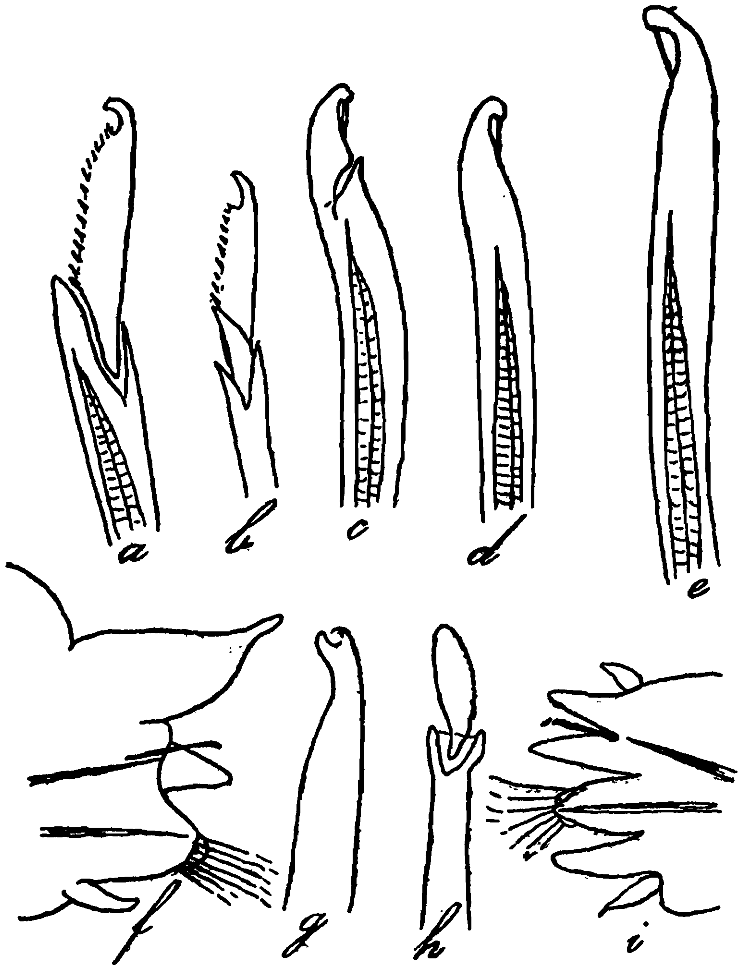


Fig. 89.—*Nereis anchylochaeta* Horst: *a, b,* ventral falcigers ×175; *c,* big half-compound bristle ×175; *d, e,* simple bristles ×184. *N. onychophora* Horst: *f, posterior* foot ×70; *g,* posterior dorsal hook ×438; *h,* dorsal homogomph falciger from mid-body ×438; *i,* anterior foot ×70.

transverse cluster of 3—4 rows; V=0; VI=4—5, in a round group on each side; VII—VIII=2 irregular rows. Dorsal ramus of the anterior feet with two subequal ligules and a small dorsal cirrus. *Dorsal ligule enlarged in the posterior feet* with subterminal cirrus. In the middle and posterior feet only *a single dorsal simple, large, hooked bristle* and an aciculum. In the ventral ramus spinigerous and small falcigerous bristles.

Length: 30 mm. by 1 mm.

Occurrence: Mergui, Jack and Una Islands.

Distribution: Marshal Islands; Malay Archipelago; Mergui.

161. **Nereis chingrighattensis** Fauvel. (Fig. 90, *a—h*)

Nereis chingrighattensis, Fauvel, 1932, p. 90, text-fig. 14.

Body cylindrical, tapering posteriorly, 80—100 segments. Prostomium not notched. Two pairs of black eyes disposed in a rectangle or a wide opened trapezium. Tentacles subulate, shorter than the large, conical, diverging palps. Peristomium somewhat longer than the succeeding segment. Tentacular cirri short, the posterior

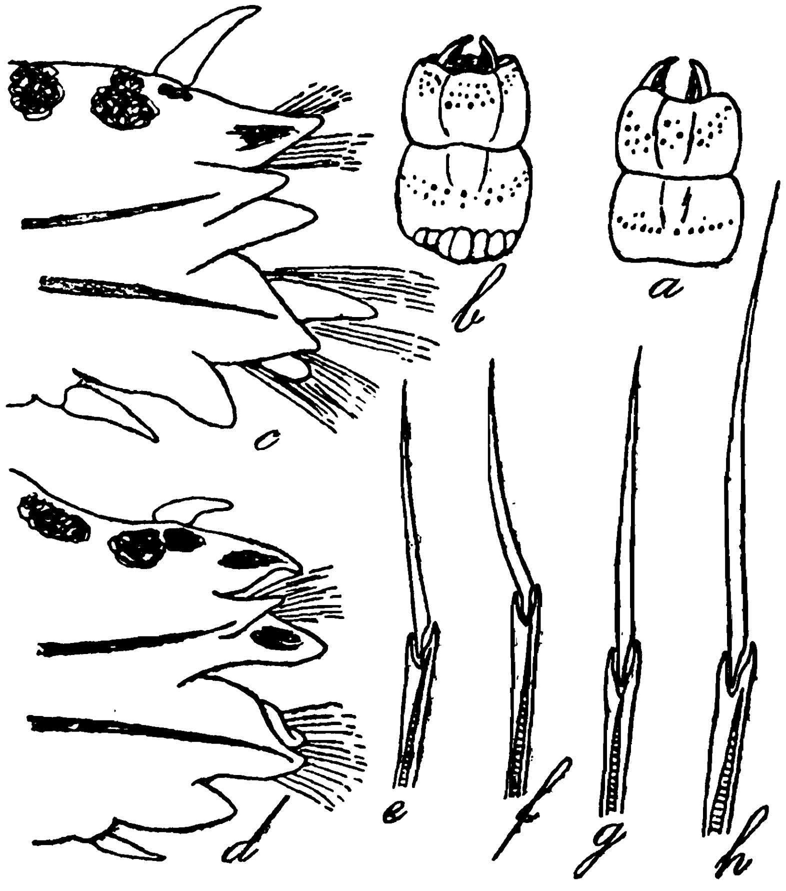


Fig. 90.—*Nereis chingrighattensis* Fauvel: *a, b*, proboscis, ventral and dorsal view; *c*, 10th foot ×35; *d*, 66th foot ×35; *e, f*, lower ventral spinigers from 65th and 30th feet ×380; *g, h*, ventral hemigomph spinigers from 30th and 65th feet ×380.

ones reaching backwards to the 4—5th setiger. Jaws pale, curved, with 6—8 teeth. Paragnaths conical, yellow or nearly colourless. I = a cluster of 4—5; II = a crescentic group; III = a transverse group of 3—4 rows; IV = an oblique group of 3—4 rows; V = 0; VI = on each side, a transverse row of 15—20, with a few smaller outer denticles; VII—VIII = 2—3 irregular rows. Feet short, both rami

subequal. Dorsal cirri subulate, shorter than the dorsal ligule. Dorsal ramus with three ligules, two subequal, triangular and a shorter conical one. Ventral ramus about the same length as the dorsal, with two fillets, the posterior one conical, the anterior one divided into two unequal lobes. Inferior ligule blunt. Ventral cirrus short subulate. In the posterior feet the median ligule of the dorsal ramus decreases in size and the ventral fillets are nearly similar, the anterior being entire or faintly bilobed. Setae numerous, slender, transparent, *all of them spinigerous.* Dorsal setae homogomph; the ventral setae homogomph, with long terminal piece, and shorter hemigomph. Lower ventral setae long hemigomph and short heterogomph. Falcigerous setae absent in both rami. Two long anal cirri.

Length: 50 mm. by 2—3 mm.

Colour: Colourless in spirit, with the exception of 2—3 yellow glands in the feet.

Occurrence: Creeks in Salt Water Lake, near Chingrighatta.

162. **Nereis cricognatha** Ehlers. (Fig. 91, *a—c*).

Nereis cricognatha, Ehlers, 1904, p. 29, pl. IV, figs. 3—7: Augener, 1913, p. 163; 1924, p. 334; 1927, p. 133: Horst, 1924, p. 158: Fauvel, 1932, p. 91.

Nereis arenaceodentata Moore, Benham, 1916, p. 134, pl. 46, figs. 1—3.

The proboscis carries numerous, horny paragnaths arranged in groups nearly fused together and forming a belt around the oral as well as the maxillary ring. Group =2, 3; II—III—IV are coalescent; V = 3, 4 or 5; VI = round clusters of 5—6; VII—VIII = *a broad belt more or less fused with V—VI forming a nearly complete ring.* Dorsal ramus with two subequal ligules. The posterior feet are not materially modified, the dorsal upper ligule being only larger than the lower, but not swollen or foliaceous; the dorsal filiform cirrus is inserted at the base. The ventral falcigerous terminal pieces are all long, knife-like, with a small curved hook at the tip; they are homogomph. There are no dorsal falcigerous bristles on the posterior feet.

Length: 20—30 mm.

Colour: Colourless in spirit.

Occurrence: Andaman Islands; shores of R. Hughly at Budge Budge; Calcutta waterworks; Gulf of Mannar.

Distribution: New Zealand; Bass Strait, Tasmania; Philippine Islands; India.

163. **Nereis glandicincta** Southern. (Fig. 91, *f–h*).

Nereisglandicincta, Southern, 1921, p. 539, pl. XXIII, fig. 9: Fauvel, 1932, p. 92; 1939, p. 314.

Head narrow in front, wide behind with two short tentacles in front. Four eyes varying considerably in size. according to the state of maturity. Proboscis: Group I =1–10 unequal; II =6–13 large, curved; III = a transverse-

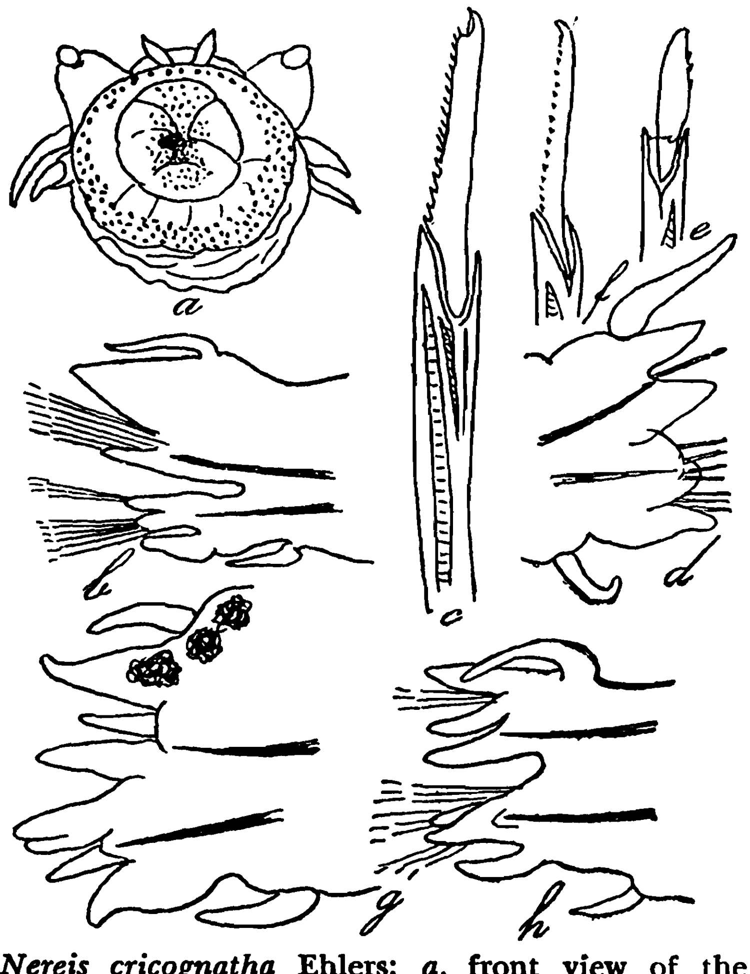


Fig. 91.—*Nereis cricognatha* Ehlers: *a*, front view of the proboscis ×14; *b*, 19th foot ×23; *c*, falciger ×875 (after Ehlers). *N. trifasciata* Grube: *d*, foot from mid-body ×52; *e*, dorsal homogomph falciger ×437. *N. glandicincta* Southern: *f*, ventral falciger ×437; *g*, foot from mid-body ×70; *h*, posterior foot ×70.

ly elongated band in 3–4 rows; IV=6–12 large denticles; V=0; VI=on each side one small denticle on a large rounded papilla; VII–VIII=a single row of a few minute denticles (occasionally missing altogether). Sometimes, the denticles of VI are very small, transparent and difficult to detect. Jaws slender. Posterior feet not material-

ly altered. Dorsal ramus with three slender lobes persisting in the posterior feet. Ventral ramus with setigerous lobe trifid in the anterior and middle feet, bifid in the posterior ones. Ventral falcigerous bristles homogomph, with long, knife-like, ciliate terminal piece. There are no posterior dorsal homogomph falcate bristles. Male *Heteronereis* with three distinct regions.

Length: 50–90 mm.

Colour: A girdle of yellow glands on each segment.

Occurrence: Salt water lakes near Calcutta, from mud; Barantolla; Vizagapatam; Coasts of Cochin State.

Distribution: Gulf of Siam; Chantabun; Taleh Sap; Pulo Condore; Singapore; India.

164. **Nereis unifasciata** Willey. (Fig. 92, *a–h*)

Nereis unifasciata, Willey, 1905, p. 271, pl. IV, figs. 85–88: Ehlers, 1817, p. 237: Horst, 1924, p. 153, pl. XXXI, figs. 3–4: Fauvel, 1930, p. 522, fig. 4; 1932, p. 93.

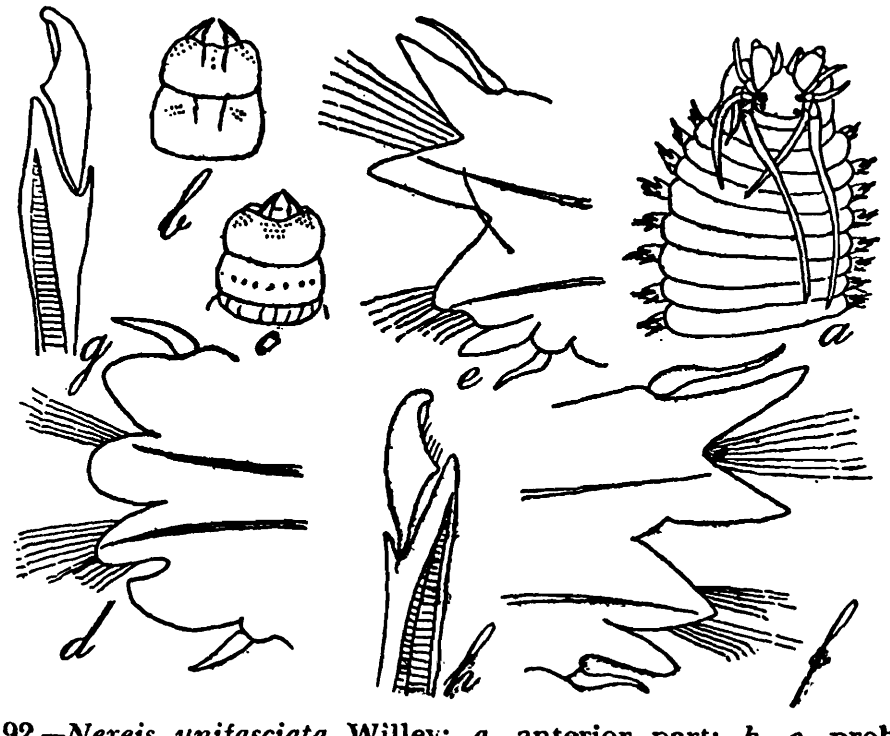


Fig. 92.—*Nereis unifasciata* Willey: *a*, anterior part; *b, c*, proboscis, dorsal and ventral view; *d*, 10th foot×35; *e*, 40th foot ×35; *f*, 63rd foot ×35; *g*, upper ventral falciger from 63rd foot ×450; *h*, lower ventral falciger from 52nd foot ×450.

Longer tentacular cirri reaching backwards to 7th–12th segment. Proboscis: Group I=3–6 in a longitudinal line; II and IV=crescentic clusters; III=a rectangular cluster of 3 rows; V=0; VI=on each side, an oval or square cluster of 2–4 irregular rows; VII–VIII=a single row of 6–7 large paragnaths. Anterior feet with short

rounded lobes, two in each ramus. In the middle and posterior feet dorsal ramus with two sub-equal, triangular, diverging ligules; ventral ramus with a conical setigerous lobe and a narrow, blunt, inferior ligule. Heterogomph ventral falcigerous bristles with a short sickle-shaped terminal piece. *There are no posterior dorsal homogomph falcigerous bristles;* in contradistinction to *N. trifasciata* Grube, a closely allied species.

Length: 10—30 mm.

Colour: Rusty brown glands, in the feet and in a line across each segment.

Occurrence: Ceylon, Tuticorin.

Distribution: New Caledonia; Philippine Islands; Moluccas; Indo-China; India; Suez Canal.

165. **Nereis trifasciata** Grube. (Fig. 91, *d, e*)

Nereis unifasciata (*non* Willey), Fauvel, 1919, p. 397; 1921, p. 7, XXI, figs. 1—7: Augener, 1922, p. 177, fig. 3: Fauvel, 1932, p. 95; 1935, p. 106; 1939, p. 313.

Nereis unifasciata (*non* Willey), Fauvel, 1919, p. 397; 1921, p. 7, pl. I, figs. 8—9.

Long tentacular cirri reaching backwards to about the 7th segment. Proboscis: Group I = 0; II and IV = crescentic clusters; III = rectangular cluster; V = 0; VI = on each side, a small cluster of 3—6; VII—VIII a single row of 2—7 small denticles. Anterior feet with short rounded lobes, two in each ramus. In the middle and posterior feet, dorsal ramus with two subequal triangular ligules, ventral ramus with a blunt setigerous lobe and a narrow conical inferior ligule. Dorsal cirri longer than the foot. Heterogomph ventral falcigerous bristles with a short sickle-shaped, smooth, or ciliated, terminal piece. *In the posterior feet, a dorsal homogomph falcigerous bristle,* with more or less elongated straight terminal piece.

Length: 10—30 mm.

Colour: Dark brown transverse streaks on the anterior segments. Dorsal glands in the feet.

Occurrence: Maldive Archipelago.

Distribution: China Sea; Philippine Islands; Indo-China; Maldive Archipelago; Madagascar; Red Sea; Juan Fernandez.

166. *Nereis talehsapensis* Fauvel. (Fig. 93, (*a–h*).

Nereis talehsapensis Fauvel, 1932, p. 93, pl. II, figs. 10–17.

Body stout, cylindrical, tapering posteriorly. 80 segments and more. Prostomium short and broad. Four eyes, of medium size, arranged in a wide-open trapezium. Two small tentacles, separated from each other at their base by the anterior rounded border of the prostomium: they are about as long as the palpophores. Palps short, large,

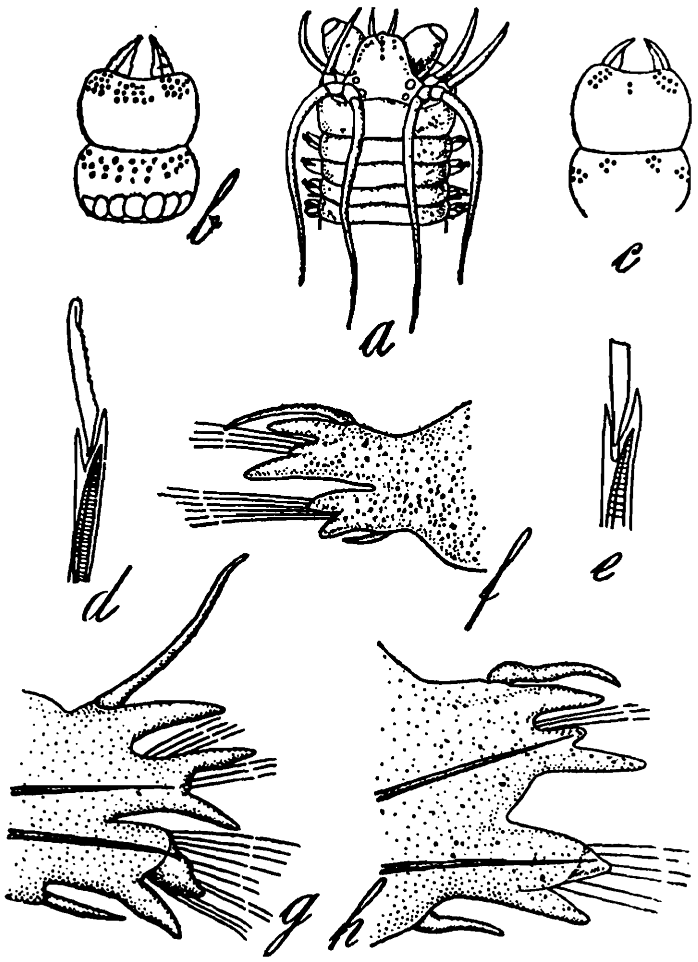


Fig. 93.—*Nereis talehsapensis* Fauvel: *a*, anterior end, dorsal view, enlarged; *b*, proboscis, ventral side, enlarged; *c*, proboscis, dorsal side, enlarged; *d*, inferior falcigerous bristle from posterior foot ×350; *e*, joint of inferior ventral hemigomph bristle ×350; *f*, 70th foot ×42; *g*, 10th foot ×42; *h*, 30th foot ×42.

conical, diverging. Peristomium larger than the following segment. Upper tentacular cirri long and slender, the posterior ones reaching backwards to the 7th–11th setigerous segment: the inferior ones subequal, hardly over-reaching the second setigerous. Jaws clearly denticulate. Proboscis: Paragnaths conical, group I = 2, one behind the other; II–IV = crescentic clusters; III = rect-

angular cluster of 3—4 rows; V = 0; VI = on each side, 4—5 large ones crosswise or in an irregular cluster; VII—VIII = 3—4 irregular rows of large conical denticles. Parapodia elongated, with somewhat slender divisions; posterior feet hardly altered. In the anterior feet, dorsal ramus with a long cirrus, three sharp pointed ligules, *the upper one shorter than the two inferior ones, borne on an elongated common base.* Ventral ramus with two unequal lobes or fillets, the anterior conical and the posterior rounded and much shorter, an inferior ligule as long as the conical fillet, a slender and short ventral cirrus. In the posterior feet, the median dorsal ligule disappears after having progressively decreased in size; the upper ligule is not enlarged. Dorsal setae homogomph spinigerous; upper ventral setae homogomph spinigerous and long hemigomph falcigerous, lower ventral setae hemigomph spinigerous, and heterogomph falcigerous, with an elongated terminal piece, ciliated and ending in a curved hook connected to the edge by a ligament. There are no dorsal homogomph falcigerous bristles in the posterior feet. Acicula rather pale. Two long, filiform, anal cirri.

Length: About 15—20 mm. by 3—4 mm.; feet included.

Colour: Discoloured in spirit.

Occurrence: Taleh-Sap, Gulf of Siam.

167. **Nereis chilkaensis** Southern. (Fig. 94, *a—c*)

Nereis chilkaensis, Southern, 1921, p. 584, pl .XXII, fig. 8: Fauvel, 1932, p. 94.

Head considerably narrower in front than behind. Prostomium projecting a little in front between the tentacles. Palps large and stout. Posterior tentacular cirri reaching back to 6—8th and even 12th segment. Proboscis: Group I = 6—10; II = 18—20; III = a cluster of 26—34; IV = triangular cluster; V = 0; VI = on each side an irregular curved row of 3—7; VII—VIII = two alternating irregular rows. Anterior feet, dorsal ramus with a long cirrus, three ligules; ventral ramus with a long cirrus, three ligules; ventral ramus with a fillet produced outwards into two conical lobes, a blunt ligule and a short ventral cirrus. In the posterior feet, the dorsal ramus is relatively larger and more prominent than the ventral ramus, but the upper ligule is not enlarged and foliaceous. Falcate heterogomph setae with moderately, long terminal pieces,

smooth at the tip, spinose below. There are no dorsal homogomph falcigerous bristles in the posterior feet.

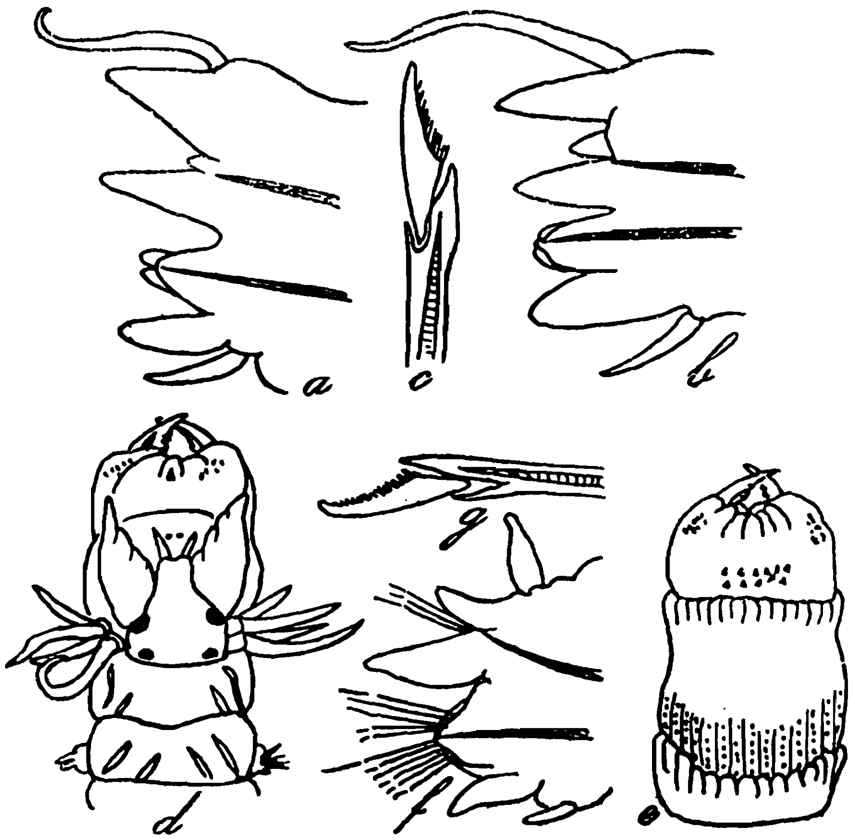


Fig. 94.—*Nereis chilkaensis* Southern: *a*, 40th foot ×45; *b*, anterior foot ×45; *c*, falciger. *N. reducta* Southern: *d*, head and proboscis; *e*, proboscis, ventral view; *f*, 60th foot; *g*, lower falciger (after *Southern*).

Length: 40–100 mm. About 80 segments.

Colour: Dorsum deeply coloured with purplish brown pigment, dark in front and growing paler behind.

Occurrence: Chilka Lake; Ennur backwater; Pamban; Madras Coast; Travancore.

168. Nereis indica Kinberg.

Nereis indica, Kinberg, 1865, p. 160: Willey, 1905, p. 970: Fauvel, 1930a, p. 24; 1932, p. 96.
Nereis sp. near *ezoensis*, Gravely, 1927, p. 13, pl. X, fig. 22.

Proboscis: Group I = 1 or 0; II = two curving rows; III = a lozenge shaped cluster; IV = triangular clusters; = 0; VI = on each side, a rounded cluster of 4–6; VII–VIII = 1 or 2 large rows and a row of numerous minute denticles. Tentacular cirri short. Dorsal ramus of the anterior feet trilobed. Posterior feet not modified, their upper ligule is not strongly enlarged. Ventral heterogomph falcigerous bristles with sickle-shaped terminal

pieces. There are no posterior dorsal homogomph falcigerous bristles.

Length: 50 mm.

Occurrence: Galle; Pamban; Waltair beach.

Distribution: Bangka Straits; Ceylon; Gulf of Mannar.

169. **Nereis coutierei** Gravier. (Fig. 95, *i, k*).

Nereis coutierei, Gravier, 1901, p. 167, pl. XI, figs. 36—41: Fauvel, 1932, p. 96; 1939, p. 312.

Body slender, small size. Prostomium not notched. Proboscis: group I = 1; II and IV = small clusters; III = a small transverse cluster; V = 0; VI = on each side, a small rounded cluster of 5—7; VII—VIII = a single row of 6—8 far apart. In the anterior feet, dorsal ramus with two conical equal ligules and a long dorsal cirrus. Ventral setigerous lobe blunt, rounded. In the posterior feet, the *dorsal ligule is enlarged into a rounded crest.* Ventral heterogomph falcigerous bristles with short sickle-shaped terminal piece. *Dorsal homogomph falcigerous bristles,* not boldly denticulate, in the posterior feet.

Length: 15—25 mm.

Occurrence: Andaman Islands, weed washings; Gulf of Mannar; Addu Atoll.

Distribution: Indo-China; Indian Ocean; India, Persian Gulf, Red Sea, Suez Canal.

170. **Nereis zonata-persica** Fauvel. (Fig. 95, *f—h*)

Nereis zonata-persica, Fauvel, 1911, p. 385, pl. XIX, figs. 10—16, pl. XX, figs. 24—25; 1932, p. 96; 1939, p. 312: Pruvot, 1930, p. 47, pl. III, figs. 65—68.

Body rounded. Proboscis: Group I = 0 or 1; II—IV = crescentic clusters; III = transverse cluster of 2—3 rows; V = 0; VI = on each side, a rounded or oval cluster of 6—10; VII—VIII = an anterior row of rather large denticles and 2—5 irregular rows of numerous small denticles. Dorsal ramus with a long cirrus and two conical sub-equal ligules. Ventral setigerous lobe short, rounded. Posterior feet not materially modified, dorsal ligule not enlarged. Ventral heterogomph falcigerous bristles with short sickle-shaped terminal piece. In the posterior feet, large *homogomph dorsal falcigerous bristles with bi- or tridentate end-pieces.*

Length: 15—30 mm.

Occurrence: Pamban; Mormugao Bay.

Distribution: New Caledonia, Indo-China; Indian Ocean, Persian Gulf, Red Sea.

Remarks: It is really a distinct species and not a simple variety of *N. zonata* as I first described it.

171. **Nereis kauderni** Fauvel. (Fig. 95, *a—d*).

Nereis kauderni, Fauvel, 1921, p. 8, pl. I, figs. 1—7; 1932, p. 97; 1939, p. 311.
Nereis falcaria, Gravely, 1927, p. 12, pl. X, fig. 20.
Nereis mortenseni, Augener, 1923b, p. 21, figs. 7—14; 1924, p. 319, fig. 4.
(?) *Ceratonereis falcaria*, Willey, 1905, p. 272, pl. IV, fig. 89.

Body small, cylindrical, slender. *Prostomium notched between the tentacles.* Tentacular cirri short. Proboscis: Group I = 0; II = a more or less irregular row; III

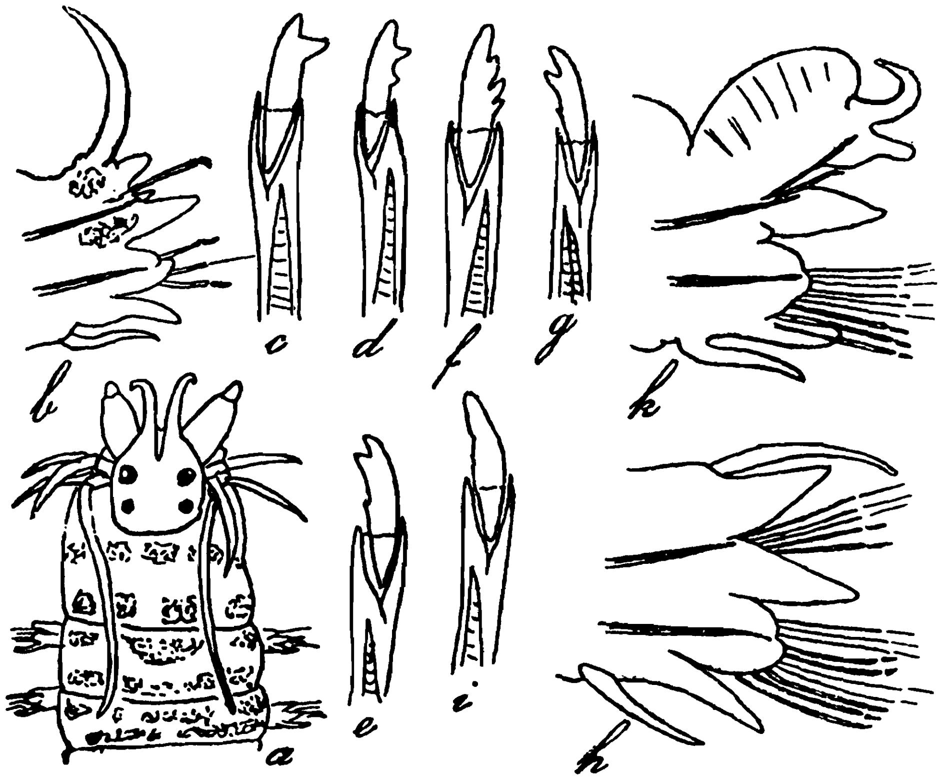


Fig. 95.—*Nereis kauderni* Fauvel: *a*, anterior part ×10; *b*, posterior foot ×40; *c*, *d*, dorsal homogomph falcigers ×333. *N. jacksoni* Kinberg: *e*, dorsal homogomph falciger ×333. *N. zonata-persica* Fauvel: *f*, *g*, dorsal homogomph falcigers ×333; *h*, foot from mid-body ×26. *N. coutierei* Gravier: *i*, dorsal homogomph falciger ×333; *k*, posterior foot ×40.

=a variable cluster; IV = a crescentic group; V = 0; VI = on each side, a small cluster of very minute paragnaths; VII—VIII = a single row of 8—9 denticles. Dorsal cirri longer than the foot. Dorsal ramus with two conical subequal ligules. Ventral setigerous lobe blunt. In the

posterior feet, the dorsal ligule is much reduced. Ventral heterogomph falcigerous bristles with sickle-shaped ciliate terminal piece. In the middle and posterior feet, *1—2 large homogomph falcigerous bristles with prominent bi- or tridentate terminal piece.*

Length: 15—30 mm.

Colour: A pattern of elongated transverse pigment spots on the anterior segments.

Remarks: Although much alike, its identity with *Ceratonereis falcaria* Willey is very doubtful, since in the latter the paragnaths are missing on the oral ring, according to Willey. But they might have been overlooked (?).

Occurrence: Gulf of Mannar; Tuticorin; Maldive Archipelago.

Distribution: Pacific Ocean, Australia, New Zealand, New Caledonia, Indo-China; Indian Ocean, India, Maldive Archipelago.

172. Nereis jacksoni Kinberg. (Fig. 95, *e*)

Nereis jacksoni, Kinberg, 1865, p. 69: Augener, 1922, p. 18: Pruvot, 1930, p. 44: Fauvel, 1930b, p. 524; 1932, p. 97.

Nereis denhamensis, Augener, 1913, p. 156, pl. III, fig. 51: Fauvel, 1917, p. 204, pl. VI, figs. 45—46.

Nereis heirissonensis, Augener, 1913, p. 159, pl. III, fig. 52.

(?)*Ceratonereis falcaria*, (*non* Willey), Benham, 1916, p. 136. pl. 46, figs. 4—10.

Body small, cylindrical, slender. *Prostomium not notched* between the tentacles. Tentacular cirri short. Proboscis: group I=0; II=two curved rows; III=a transverse cluster; IV=on each side, crescentic clusters; V=0; VI= on each side a small cluster of very small denticles; VII—VIII=a single row of about 7, wide apart. Dorsal ramus with two conical, subequal ligules. Dorsal cirri longer than the foot. Ventral setigerous lobe blunt. In the posterior feet, the dorsal ligule is more or less reduced. Ventral heterogomph falcigerous bristles with sickle-shaped ciliate terminal piece. In *the middle and posterior feet,* 1—2 *large homogomph falcigerous bristles with prominent bi- or tridentate terminal piece.*

Remarks: Differs chiefly from *N. kauderni* Fauvel in having its prostomium not notched.

Length: 15–30 mm.

Colour: Dorsal pattern variable.

Occurrence: Andaman Islands; Kilakarai; Maldive Archipelago.

Distribution: Pacific Ocean, Australia, New Zealand, New Caledonia, Indo-China; Bay of Bengal, Arabian Sea.

173. **Nereis reducta** Southern. (Fig. 94, *d–g*).

Nereis reducta, Southern, 1921, p. 593, pl. XXI, figs. 7a–7k.

Body narrow. Palps long and pointed. Eyes small. Tentacular cirri rather short. Proboscis: Group I = a single large paragnath; II=6 of varying size; III=11; IV = 8–10; V = 0; VI = minute paragnaths; VII–VIII = numerous paragnaths in longitudinal rows. Anterior feet with short fusiform, dorsal and ventral cirri, two upper and two lower lobes. In the posterior feet the upper dorsal lobe is much reduced in size and is smaller than the median ligule. The dorsal setae are few and the spinous heterogomph setae occur singly in the middle and posterior segments. The falcate setae have tips nearly straight and of medium size.

Length: 50 mm. 96 segments.

Colour: Head and anterior segments pale brown.

Occurrence: Chilka Lake, about a mile inside the mouth. Only a single specimen.

174. **Nereis gisserana** Horst. (Fig. 96, *e–i*).

Nereis gisserana, Horst, 1924, p. 151, pl. XXX, figs. 6–7: Monro, 1939, p. 394, fig. 302.

Palps short and stout. Tentacular cirri very long, the longest reaching back about the 15th setiger. Proboscis: Group I = 0; II = a transverse row of about 5; III = *three groups, a middle one of three rows of small paragnaths and two lateral groups each of two;* IV = a small patch of rather larger denticles; V = 0; VI, on each side, 3 in a transverse row; VI–VIII = *a single row of 5–6, widely separated.* In the anterior region, the lobes of the feet are short and blunt, but they gradually lengthen from

before backwards. Dorsal ramus with two unequal conical lobes and long dorsal cirrus. The shorter lower dorsal languet is fused for part of its length with a slightly middle languet. Ventral ramus much shorter, especially in the posterior feet where the dorsal ramus greatly overshadows the ventral, but there is no special development of the upper dorsal languet. Heterogomph falcigers with short and broad end-piece, which becomes longer and hooked in the posterior feet.

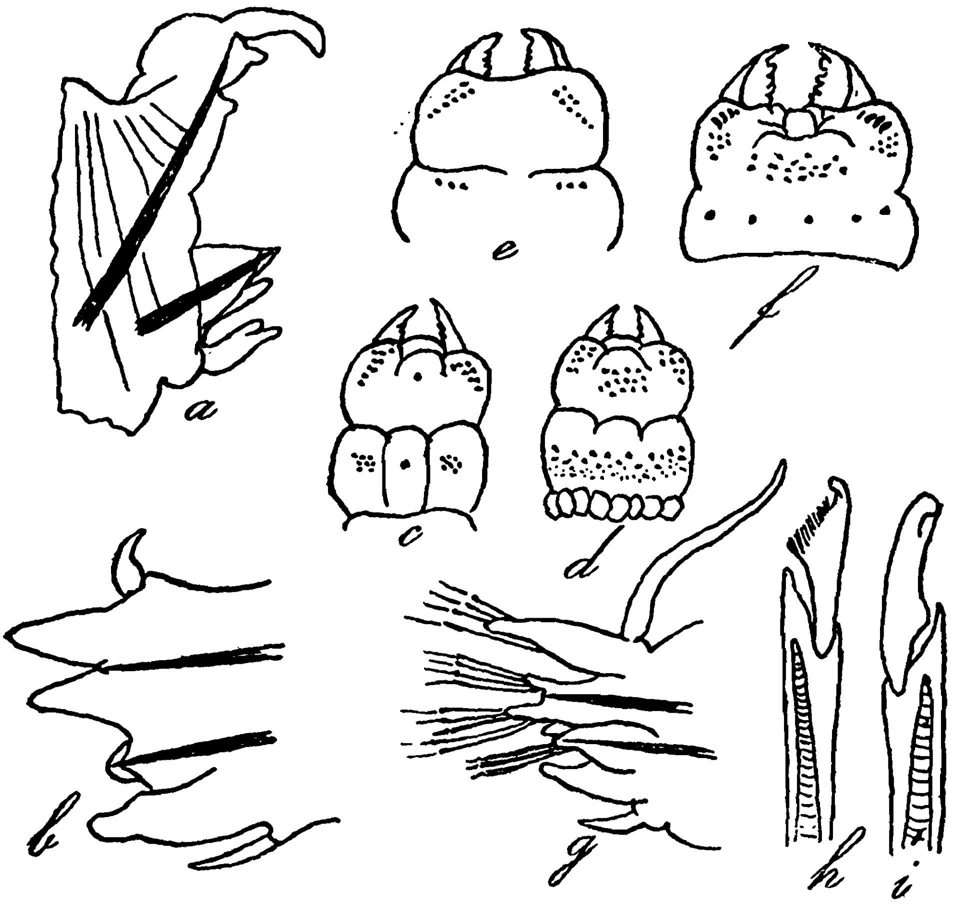


Fig. 96.—*Nereis heteromorpha* Horst: *a*, posterior foot (after Horst). *N.* (*Neanthes*) *capensis* Willey: *b*, foot from mid-body; *c*, *d*, proboscis dorsal and ventral view: *N. gisserana* Horst: *e*, *f*, proboscis, dorsal and ventral view; g, foot from mid-body; *h*, falciger from mid-body; *i*, falciger from hinder foot (after Monro).

Length: 45 mm. by 2 mm.

Occurrence: Maldive Archipelago.

Distribution: Malay Archipelago; Maldive Archipelago; Amirante Islands.

175. Nereis longilingulis Monro. (Fig. 97, *a—c*).

Nereis longilingulis, Monro, 1937, p. 277, fig. 9.

Body much tapered behind. Head longer than broad, not incised between the tentacles. Palps stout, about equal to the tentacles. Proboscis without paragnaths in the larger specimens. In the small ones, group I = 0; II = small crescentic patches; III = a transverse row of 4 relatively large paragnaths; IV = small crescentic patches; V =

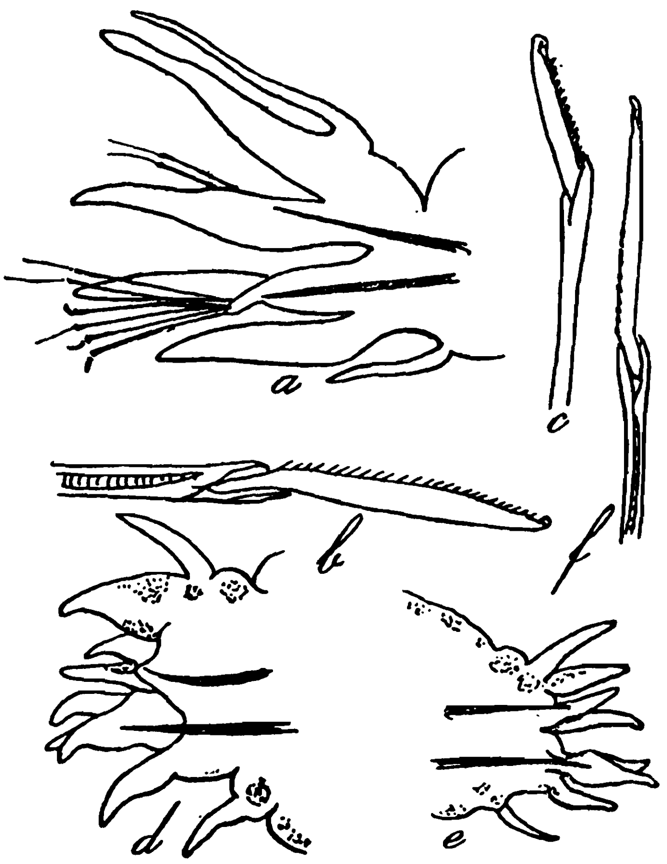


Fig. 97.—*Nereis longilingulis* Monro: *a*, 20th foot; *b*, ventral falciger from mid-body; *c*, ventral falciger from hinder region (after Monro). *N.* (*Ceratonereis*) *burmensis* Monro: *d*, 10th foot; *e*, hinder foot; *f*, falciger (after Monro).

0; VI=a single small one on each side; VII=*a single small one;* VIII=0. Anterior feet with two triangular lobes in each ramus, median feet with *two dorsal flagelliform languets* longer than the dorsal cirrus; in the ventral ramus the lips of the chaeta-sac and the ventral languets are prolonged into a long slender process. At the 70th setiger all the languets are slender, but very much reduced in length. Ventral hemigomph falcigers with a long, straight blade, shorter in the posterior feet. There are no dorsal homogomph falcigers.

Length: 45 mm. by 2 mm. 80 setigers.

Remarks: Differs from *C. flagellipes* Fauvel in having one, and not two, flagelliform processes arising from the ventral chaeta-sac, different blades to the falcigers, and paragnaths on both rings of the proboscis.

Occurrence: North Arabian Sea.

Distribution: Arabian Sea.

176. Nereis heteromorpha Horst. (Fig. 96, *a*)

Nereis (Lycoris) heteromorpha, Horst, 1924, p. 152, pl. XXXI, figs. 1–2: Augener, 1926, p. 449.

Male *Heteronereis* with body divided into three regions. Anterior atocous part with 14 segments, epitocous part with 32–45 segments; posterior part atocous, with reduced lobes having neither lamellae nor swimming bristles. Head with two pairs of large coalescent eyes, tentacles and palps bent backwards under the head. Tentacular cirri rather short. Dorsal cirri of the anterior seven parapodia swollen below the tip. In the epitocous parapodia the dorsal ligule is conically elongated, whereas the ventral one has a lamella-shaped distal extremity; a rather large fan-shaped lamella is situated at the base of the dorsal cirrus which bears, along its ventral border, 14 papillae. Ventral cirrus provided ventrally with a large lamella and, dorsally, with an elongated one; the neuropodial lobe bears a large cordiform lamella. In the caudal region, a dorsal, stout, pale aciculum and a ventral blackish one. Proboscis: Group I = 1–2 paragnaths behind one another; II = a crescentic cluster; III = a transverse curved group in 3–4 rows; IV = a curved triangular one; V = 0; VI = on each side, a transverse row of 5–6 denticles; VII–VIII = a monostichous belt of 12 paragnaths.

Length: 8–10 mm. *Atocous phase unknown.*

Occurrence: Ceylon, Trincomali.

Distribution: Malay Archipelago; India.

Subgenus NEANTHES Kinberg.

All groups of the proboscis present.

177. Nereis (Neanthes) capensis Willey. (Fig. 96, *b–d*)

Neanthes capensis, Willey, 1904, p. 261, pl. XIII, fig. 10, pl. XIV, figs. 9–10: Fauvel, 1911, p. 384.

Neanthes albanyensis, Augener, 1913, p. 149, pl. II, fig. 6: Fauvel, 1917, p. 206, fig. 16; 1927, p. 430.

Longer tentacular cirri reaching backwards to the 7th—11th segment. Proboscis: Group I=1 or 2; II=triangular clusters; III=a transverse cluster; IV=rectangular cluster; V=1 or 3; VI=on each side, a cluster of 3—6; VII—VIII=3—4 rows. Anterior feet with short rounded lobes, 3 in the dorsal ramus, and short dorsal cirri. Middle and posterior feet with sharper lobes, dorsal lobes not increased. End-pieces of the falciform heterogomph setae small, short, broad. There are no posterior dorsal homogomph falcigerous bristles.

Length: 30 mm. by 5 mm.

Colour: Two dark glands in the feet.

Occurrence: Persian Gulf.

Distribution: Australia; New Zealand; Persian Gulf; Suez Canal; Cape of Good Hope.

178. **Nereis (Neanthes) meggitti** Monro.

Nereis (*Neanthes*) *meggitti*, Monro, 1931, p. 580, figs. 1—6.

Prostomium as broad as long. The longest tentacular cirri reach back to the 7th—10th setiger. Proboscis: Group I=a cluster of 4 very small paragnaths; II=oblique clusters of 10—12 small ones; III=about 4 rows of numerous small; IV=oblique groups of about 15; V=a group of 4—6 rather large ones; VI=4—5 rather large paragnaths, on each side; VII—VIII=a *continuous band of 4 rows of small paragnaths.* In the anterior feet, dorsal ramus with three triangular, pointed, upper lobes of about equal size. Dorsal cirrus slender. In the posterior segments, there is no substantial enlargement of the upper dorsal lamella but, relatively to the dorsal ramus, the ventral ramus is much reduced. There are no dorsal homogomph falcigers.

Length: 30 mm. by 2 mm.

Colour: Male and female. *Heteronereis*: In spirit, vestiges of a narrow black stripe down the middle of the back.

Occurrence: Rangoon River, forty miles from the mouth, in fresh water.

Subgenus CERATONEREIS Kingberg.

Paragnaths missing on the oral ring.

179. **Nereis (Ceratonereis) costae** Grube. (Fig. 98, *a—f*)

Nereis (*Ceratonereis*) *costae*, Fauvel, 1923, p. 349, fig. 136 *a—f*; 1939, p. 320.

Nereis (*Ceratonereis*) *fasciata* Grube, Gravier, 1901, p. 174, pl. XXI, figs. 45.

Nereis (*Ceratonereis*) *lapinigensis,* Grube, 1878. p. 69.

Ceratonereis pectinifera Grube, Willey, 1905, p. 272, pl. IV, figs. 90–91.

Tentacular cirri rather short. Prostomium not incised. Proboscis: Group I = 0; II = 2 crescentic rows; III = 3–8, set in a triangle or a lozenge; IV = square clusters. In the anterior feet, three dorsal ligules, the median one shorter. In the posterior feet the dorsal ramus over-

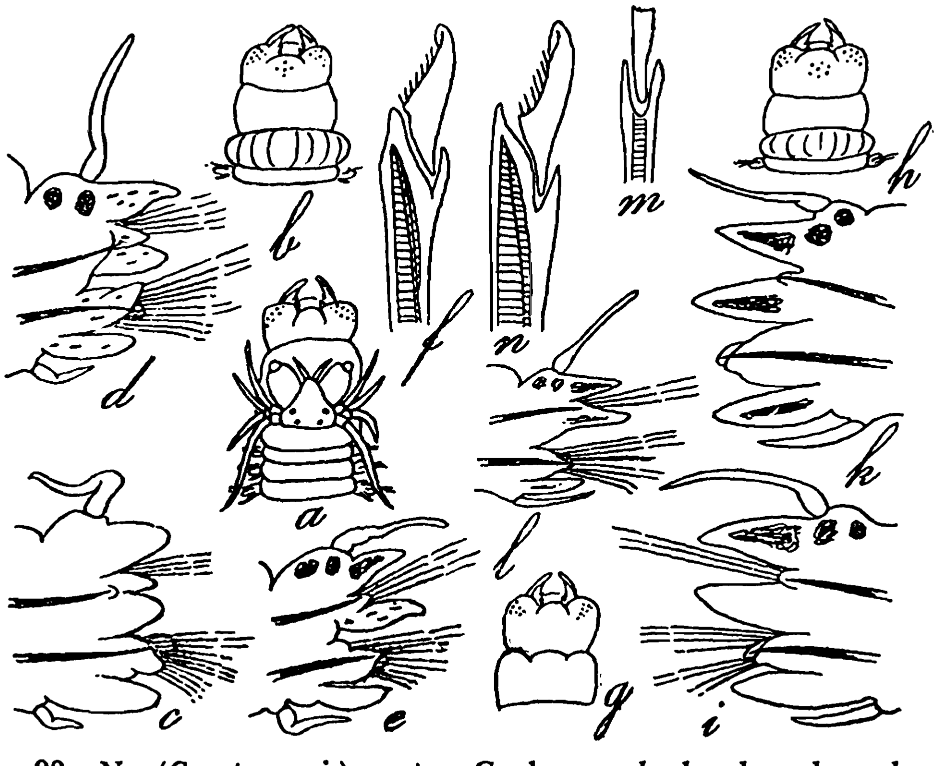


Fig. 98.—*N.* (*Ceratonereis*) *costae* Grube: *a, b,* head and proboscis; *c, d,* 11th and 18th feet ×20; *e,* posterior foot ×20; *f,* falciger ×350. *C. hircinicola* (Eisig): *g-n* (not yet found in India).

shadows the ventral one. Dorsal cirrus longer; ventral cirrus short. Posterior ventral falcigerous bristles with a stout yellow shaft and a hooked end-piece. There are no dorsal homogomph falcigers.

Length: 20–80 mm.

Colour: Very variable; yellowish, pink, green, with streaks of brown dots.

Occurrence: Ceylon.

Distribution: Australia, Philippine Islands, Indo-China, Malay Archipelago; Indian Ocean,: Red Sea, Persian Gulf; Atlantic Ocean.

180. **Nereis (Ceratonereis) pachychaeta** Fauvel. (Fig. 99, *a—h*).

Ceratonereis pachychaeta, Fauvel, 1919, p. 403, fig. VIII, pl. XV, figs. 22—25; 1923, p. 41; 1933, p. 57.

Body short, tapering backwards. Prostomium not notched. Tentacular cirri short. Proboscis: Group I = 1; II = 4—8 in a single, curved, row; III = 2—3 behind one another; IV = triangular clusters of 4—6. Dorsal cirri slightly longer than the feet. Anterior feet with three

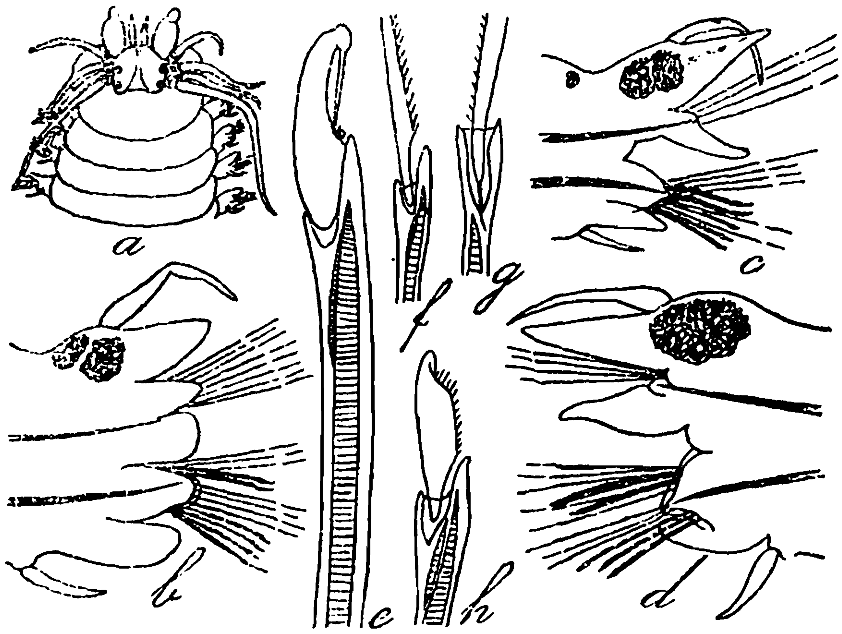


Fig. 99.—*N.* (*Ceratonereis*) *pachychaeta* Fauvel: *a*, anterior part ×8; *b*, anterior foot ×30; *c*, posterior foot ×30; *d*, foot from mid-body ×30; *e*, large upper ventral falciger ×300; *f*, *g*, heterogomph and homogomph articulations ×300; *h*, lower ventral falciger from 20th foot ×300.

dorsal, sub-equal, rounded ligules. In the posterior feet, two dorsal, unequal, pointed ligules; ventral ramus shorter, with several very *stout heterogomph falcigers with end-piece hooked and more or less fused with the stalk.* Lower falcigers with shorter hooked end-piece not fused.

Length: 30—45 mm. by 3—4 mm.

Colour: In spirit, copper coloured with transverse bands of tiny dark spots and dark glands.

Occurrence: Maldive Archipelago, Hulu Male.

Distribution: Tahiti, Gambier Islands; Maldive Archipelago; Red Sea; Gulf of Suez; Madagascar.

181. **Nereis (Ceratonereis) burmensis** Monro. (Fig. 97, *d—f*).

Nereis (*Ceratonereis*) *burmensis*, Monro, 1937b, p. 532, fig. 1.

Prostomium not incised. Palpostyles small, button-like. Four small black eyes in a rectangle. Longer tentacular cirri reach back to the 6th setiger. Proboscis: No paragnaths on the proximal ring, Group I = a patch of very small paragnaths; II = narrow oblique clusters of relatively large ones; III a rather wide transversal band of about three rows of very small denticles; IV = an oblique cluster of about 10. Short subulate cirri. Dorsal ramus with 3 triangular ligules. Ventral ramus with 4 languets, but only 3 in the posterior feet, which are not increased. Bristles delicate and slender. Ventral falcigers with long, straight, slender end-piece: *they are confined to a short median region.* Further back there are only spinigers. There are no dorsal homogomph falcigers. *Heteronereis* male with modification of the feet at about the 21st setiger.

Length: 45 mm. by 2 mm.

Colour: In spirit, grey-green, with a black median dorsal stripe over about the first ten setigers and traces of black transverse segmented bands. Black pedal glands.

Occurrence: Off Bombay; Maungmagan, Burma.

Remarks: Feet very close to *N. chingrighattensis.* Allied to *Ceratonereis similisetis* Grube, which has no falcigers and a different shape of feet.

182. **Nereis (Ceratonereis) tripartita** Horst. (Fig. 100, *a—d*)

Nereis (*Ceratonereis*) *tripartita,* Horst, 1924, p. 183, pl. XXXVI, figs. 1—2: Fauvel, 1932, p. 99, fig. 15.

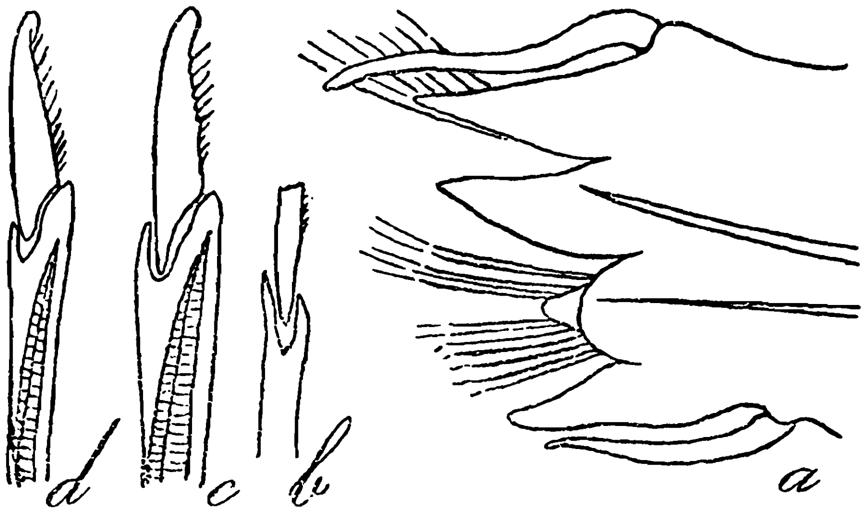


Fig. 100.—*N.* (*Ceratonereis*) *tripartita* Horst: *a,* 9th foot ×45; *b,* heterogomph falciger from hinder foot ×400; *c,* upper ventral falciger from 9th foot ×400; *d,* lower ventral falciger from 9th foot ×400.

Tentacular cirri reaching backwards to the 8th–9th segment. Proboscis: Group I =0; II and IV =triangular clusters of numerous small, pale paragnaths; III=a large transverse cluster of several rows. In the anterior feet, a dorsal cirrus longer than the foot, two sub-equal sharp conical dorsal ligules. Ventral setigerous lobe short and blunt; ventral cirrus long and slender. Posterior feet not increased. Homogomph and heterogomph spinigerous bristles. Ventral heterogomph falcigerous bristles with sickle-shaped, ciliate, terminal piece; some of them very stout, but compound. There are no posterior dorsal homogomph falcigerous bristles. Atocous specimen; those of *Horst* were all epitocous, divided into three regions.

Occurrence: Andaman Islands, in coral.

Distribution: Malay Archipelago; Andaman Islands.

183. **Nereis (Ceratonereis) microcephala** Grube. (Fig. 101, *a–b*)

Nereis (*Ceratonereis*) *microcephala*, Grube, 1878, p. 65: Fauvel, 1932, p. 99, fig. 16.

Prostomium small, not notched between the tentacles. Four black eyes arranged in a widely opened trapezium.

Fig. 101.—*N.* (*Ceratonereis*) *microcephala* Grube: *a*, foot from mid-body ×60; *b*, 20th foot ×60.

Tentacles shorter than the palpophores which are very large, blunt, conical and diverging. Two inferior pairs of tentacular cirri shorter than the upper ones, which reach backwards to the 7th–8th segment. Proboscis: Maxillary ring small, oral ring (devoid of paragnaths) much larger. Group I = 0; II = crescentic clusters of 2–3 rows; III = a broad and transverse cluster of 3–4 irregular rows; IV = several curved rows. The posterior feet are not

modified. In the anterior feet, dorsal ramus with two triangular subequal ligules and dorsal cirrus about the length of the ligules: ventral setigerous lobe conical, as long as the dorsal ramus; ventral ligule blunt and much shorter. Ventral cirrus small, much shorter than the ventral ligule. Dorsal and upper ventral spinigerous bristles homogomph; lower ventral ones heterogomph. All setae long and slender. Falcigerous homograph ventral setae present in anterior feet, missing in the posterior ones.

Differs from *C. tripartita* in (1) the shape of the feet which are shorter and more blunt; (2) its very much shorter ventral cirrus, and (3) the absence of posterior ventral falcigerous bristles and in its more slender setae. The armature of the proboscis is the same.

Occurrence: Taleh-Sap, Gulf of Siam.

Distribution: Philippine Islands; Gulf of Siam.

184. **Nereis (Ceratonereis) flagellipes** Fauvel. (Fig. 102, *a—h*)

Nereis (*Ceratonereis*) *flagellipes*, Fauvel, 1932, p. 100, pl. III, figs. 1—8.

Prostomium broader than long, not notched between the tentacles. Four rather large eyes, with a lens, arranged in a widely opened trapezium. Tentacles about the length of the palpophores. Palps stout, ovoid. Tentacular cirri rather short, the longer reaching backwards to the 6th setigerous segment. Peristomium hardly longer than the succeeding segment. Jaws very pale yellow, transparent, with 5—6 teeth, the inferior ones blunt. Paragnaths missing on the oral ring. On the maxillary ring they are sharply conical, transparent, little conspicuous. Group I=0 (or 1?); II=small clusters of 3—4; III =a transverse row of 3; IV=small clusters of 2—5. Parapodia: On the first 5—6 setigerous segments, the dorsal cirrus is more or less of the same length as the dorsal ligule. The dorsal and ventral rami are divided each into two elongated conical ligules whose tip is already slightly filiform in the upper dorsal one. The ventral cirrus is shorter. In the suceeding feet, the dorsal ligules become flagelliform (whip-like) and much longer than the cirrus. In the ventral ramus, the setigerous lobe is much elongated and divided at the tip into two filiform appendages corresponding to the two fillets. The ventral ligule is whip-like and nearly as long as the dorsal ligules, and the ventral cirrus is much shorter. Behind the 20th foot, the ligules still increase in length, especially the

ventral one, and are more or less coiled. (The posterior feet are unknown.) The dorsal bristles are slender homogomph spiningers. The upper ventral bristles are long and slender homogomph spinigers and heterogomph falcigers; the lower ventral ones are hemigomph, or faintly heterogomph, spinigers and long heterogomph falcigers.

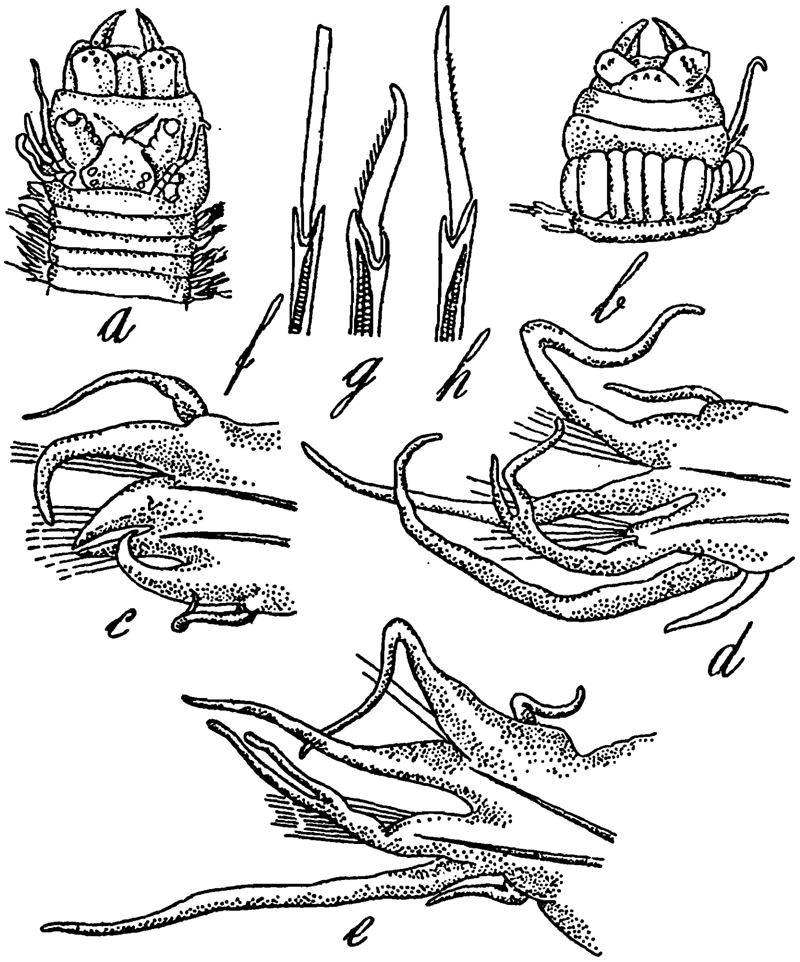


Fig. 102.—*Nereis* (*Ceratonereis*) *flagellipes* Fauvel: *a*, anterior end, dorsal view; *b*, proboscis, ventral view; *c*, 5th foot; *d*, 21st foot; *e*, 35th foot; *f*, homogomph spinigerous bristle; *g*, inferior falcigerous bristle from posterior foot; *h*, inferior falcigerous bristle from anterior foot.

Only a single anterior fragment, 32 mm. by 2 mm. and 36 segments, was collected.

Occurrence: 25 miles south of Barwa Beacon, Ganjam Coast, 93 fms.

185. Nereis (Ceratonereis) mirabilis Kinberg. (Fig. 103, *a—c*).

Ceratonereis mirabillis, Kinberg, 1865, p. 70: Ehlers, 1887, p. 117—172, pl. XXXVIII, fig. 1—6: Gravier, 1901, p. 172, pl. XI, fig. 12: Fauvel, 1917, p. 207 (Synonymy); 1932, p. 98: Gravely, 1927, p. 13, pl. X, fig. 21.

Ceratonereis tentaculata Kinberg, Augener, 1913, p. 168: Horst, 1924, p. 180, pl. XXXV, figs. 4–7.

Prostomium *deeply cleft* between the tentacles. Palps elongated. *Tentacular cirri and dorsal cirri very long.* Proboscis: Group I=0; II and IV=triangular clusters, III=a transverse cluster of several rows. Paragnaths missing on the oral ring. Dorsal ramus with two long, slender, subequal ligules. Posterior feet little modified. Spinigerous setae homogomph and heterogomph. Falcigerous setae heterogomph, with *long, straight, ciliated*

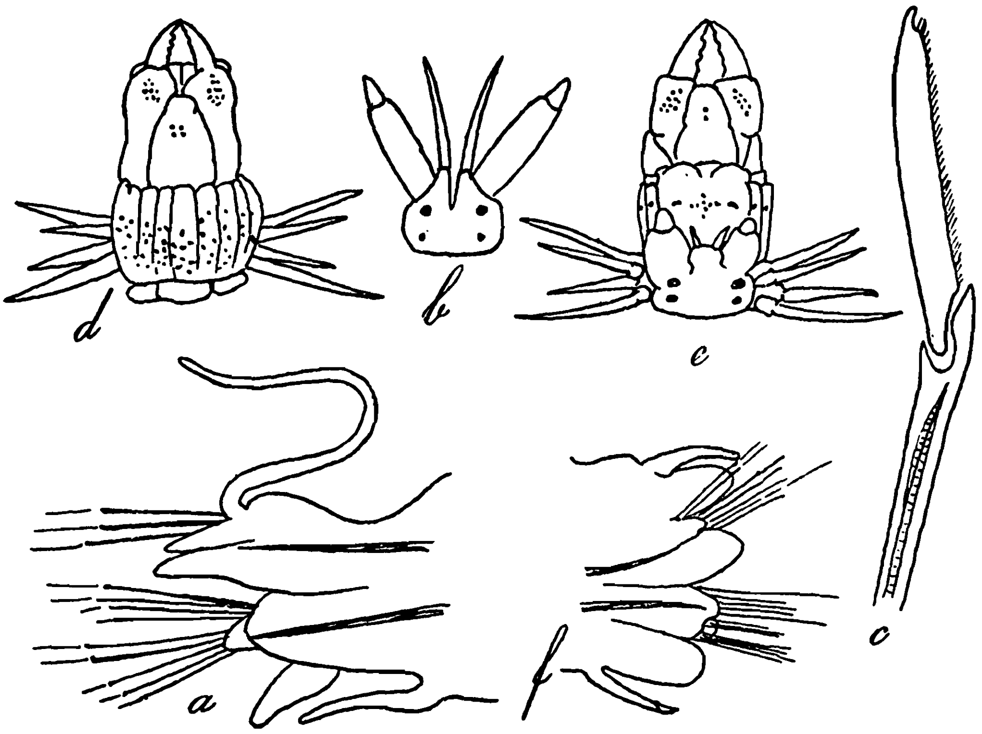


Fig. 103.—*N.* (*Ceratonereis*) *mirabilis* Kinberg: *a,* 40th foot ×80; *b,* head; *c,* upper ventral falciger ×500: *Perinereis barbara* Monro: *d, e,* proboscis, ventral and dorsal view ×6; *f,* anterior foot ×25.

terminal piece, becoming shorter and more sickle-like in the posterior feet. Dorsal homogomph falcigerous bristles in the posterior feet.

Length: 30 mm.

Colour: In life, semi-transparent.

Occurrence: Andaman Islands, Gulf of Mannar, Krusadai Island, Pamban, Kilakarai, from coral reefs; Maldive Archipelago.

Distribution: Pacific Ocean; Indian Ocean, Persian Gulf, Red Sea; Atlantic Ocean, Brazil, West Indies.

Genus PERINEREIS Kinberg.

Parapodia biramous. Horny paragnaths on both rings of the proboscis. Paragnaths of Group VI transverse, ridge-shaped, or a transverse row of more or less flattened denticles.

Key to the species of Perinereis.

1. Body divided into 3 regions	*maindroni* Fauvel, p. 203.
Body not divided into 3 regions	2
2. Paragnaths of groups VII—VIII absent ..	*suluana* Horst, p. 204.
Groups VII—VIII present	3
3. Heterogomph spinigers absent ..	*barbara* Monro, p. 204.
Heterogomph spinigers present	4
4. A transverse row of many small denticles in group VI ..	5
Only one or two large flattened paragnaths in each group VI	6
5. Groups I and II absent ..	*neocaledonica* Pruvot, p. 211.
Groups II present ..	*nuntia* Savigny, p. 212.
6. Two transverse paragnaths in each group VI	7
A single transverse paragnath in each group VI T ..	9
7. A single paragnath in group V	*singaporiensis* Grube, p. 205.
A triangular patch of three paragnaths in group V ..	8
8. Paragnaths of group VI narrow and little flattened	*aibuhitensis* Grube, p. 209.
Paragnaths of group VI broad and flattened	*vancaurica* Ehlers, p. 205.
9. Group V missing	*cavifrons* Ehlers, p. 210.
A triangular patch of three paragnaths or a single large one, in group V	10
10. A cluster of 4—12 paragnaths in group I. Posterior feet enlarged	*nigropunctata* Horst, p. 210.
One, two or three paragnaths behind one another in group I. Posterior feet not materially enlarged	11
11. Tentacular cirri reaching backwards to the 5—6th setigerous segment	*cultrifera* Grube, p. 206.
Tentacular cirri reaching backwards to the 7—9th setigerous segment	*helleri* Grube, p. 208.

186. Perinereis maindroni Fauvel. (Fig. 104, *e—i*)

Perinereis maindroni, Fauvel, 1943, p. 201, fig. 1, *e—i*.

Body small, slender, divided into three regions. Four eyes set in a trapezium. Tentacles shorter than the conical palps. The longer dorsal cirrus reaches back to the third setigerous segment. Proboscis with *very small, transparent, conical paragnaths, not easily detected.* Group I=1 or 0; II and IV=curved rows; III=a small transverse cluster; V=0; VI=on each side, a transverse row of 5—6 conical or slightly flattened paragnaths; VII—

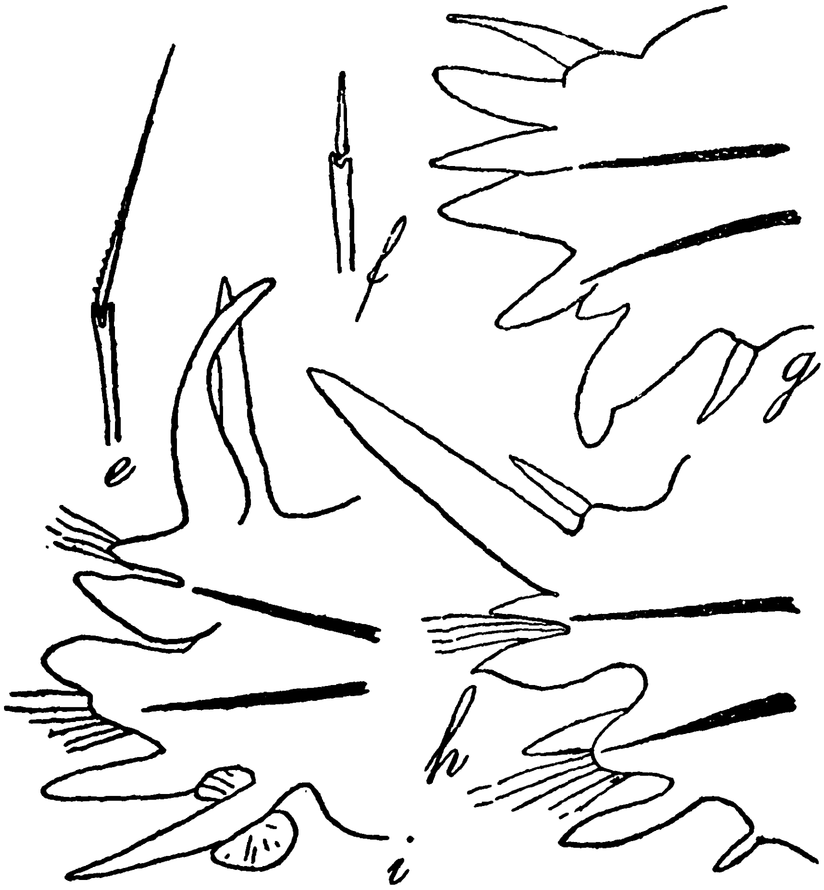


Fig. 104.—*Perinereis maindroni* Fauvel: *e, f,* long and short spinigers ×380; *g,* anterior foot ×80; *h,* foot from mid-body ×80; *i,* semi-epitocous foot ×80.

VIII=3 rows. *Anterior region* with a score of segments, the feet of which carry three dorsal subequal ligules and three ventral ones, with the intermediate one shorter. Dorsal cirrus about the same length as the upper ligule. Ventral cirrus short. *Middle region*: 20—24 segments. Dorsal ligule narrow, and about twice or thrice as long as the two others and the dorsal cirrus, which is inserted at its base. *Posterior region*: 12—15 segments, the last ones very small. The dorsal ligule decreases rapidly.

Setae very small and slender. Falciform endpieces rather long and slender. There are no homogomph falcigers. Two long anal cirri.

Length: 15—18 mm.

Colour: In spirit yellowish, with, sometimes, a brown collar behind the head and a few streaks on the back of the anterior segments.

Occurrence: Pondichery (M. Maindron col.).

Remarks: One of the specimens is a sub-epitocus male, with incipient lamellae on the ventral cirrus, but without oar-shaped setae. The others, though atocous, are nevertheless clearly divided into three regions, which is very unusual in atocous Nereids.

187. **Perinereis barbara** Monro. (Fig. 103, *d—f*).

Perinereis barbara, Monro, 1926, p. 316, figs. 3—5.

Prostomium of the usual shape. Longest tentacular cirri reach back to the third setiger. Proboscis: Group I =2 paragnaths, a smaller followed by a larger; II=an oblique distichous group of about 12 paragnaths; III= a small transverse group of about 9; IV=a large crescentic group; V=*a longitudinal row of 4 paragnaths;* VI=2 *small paragnaths on the border of group V and a single larger linear paragnath, on each side;* VII—VIII= a band of paragnaths about four deep. (Variations occur in group VI.) Anterior feet with long dorsal cirrus and two dorsal lobes; the lip of the ventral seta-sac is just shorter than the inferior one. Ventral languet sub-digitiform. Posteriorly the languets all become longer and more pointed. There is nothing remarkable about the setae and their arrangement, except that there appear to be no heterogomph spinigers present.

Length: 40 mm. by 2 mm.

Colour: In spirit, pale yellow.

Occurrence: Singapore Beach.

Distribution: East Australia, Port Jackson; Singapore.

188. **Perinereis suluana** Horst. (Fig. 105, *e*).

Perinereis suluana, Horst, 1924, p. 175, pl. XXXIII, fig. 9: Monro, 1926, p. 318: Fauvel, 1932, p. 102.

Posterior tentacular cirri, rather slender and streaked with brown pigment, reach backwards to the 4th setigerous segment. The palps, longer than the tentacles, are

stout and cylindrical. The eyes are large, black, with a lens, and set in a square. Proboscis: group I = 2—3 in a line; II and IV=clusters; III=a transverse cluster of 3—4 rows; V=0; VI=on each side, a single ridge-shaped paragnath. *Groups VII—VIII absent.* In the posterior feet, the dorsal ligule is larger and protrudes above the ventral ramus but is not foliaceous and flag-like. Falcigerous setae with a short terminal piece.

Colour: Prostomium white with three longitudinal brown streaks. Back dark-brown with a narrow white line across the middle of each segment. Further on, the white line divides the segment into two unequal brown bands. In the posterior part, the pigment is reduced to two or three transverse, narrow, patches.

Occurrence: Andaman Islands.

Distribution: Sulu Archipelago; Andaman Islands; Darros Island in the Amirante Islands.

189. **Perinereis singaporiensis** Grube. (Fig. 105, *a—d*)

Perinereis singaporiensis, Grube, 1878, p. 84: Horst, 1924, p. 169, pl. XXXIV, figs. 1—2: Pruvot, 1930, p. 55, pl. III, figs. 62—64: Fauvel, 1932, p. 103: Monro, 1931, p. 36, figs. 1—2.

Proboscis: group I = 1—3; II = a rhomboidal cluster of 8—9; III = a transverse tristichous group; IV = crescentic groups; V=0; VI=on each side 2 transversely elongated paragnaths (with one or two conical ones between them?) ; VII—VIII = two or three rows. Terminal piece of the falcigerous bristles rather long, little curved and ciliated. Posterior feet not increased but dorsal ligules stout and protruding above the ventral ramus.

Length: 80 mm. by 3 mm.

Colour: A dark median stripe on anterior segments. Black pedal gland conspicuous.

Occurrence: Singapore; Mergui.

Distribution: New Caledonia; Malay Archipelago; Singapore; Mergui Archipelago, Jack and Una Islands; Burma, Diamond Island.

190. **Perinereis vancaurica** (Ehlers). (Fig. 105, *f—g*)

Nereis vancaurica, Ehlers, 1864, p. 503, pl. XX: Fauvel, 1923, p. 34 (Synonymy); 1932, p. 103.

Nereis languida, Grube, 1867, p. 13, pl. II, fig. 1.

Perinereis horsti, Gravier, 1901, p. 182, pl. XI, fig. 47.

Perinereis nankaurica, Augener, 1922a, p. 23.

Proboscis: group I = 1, 2; II = crescentic clusters; III = a square cluster; IV = triangular clusters; V = 3, set in a triangular patch; VI = on each side, two transverse elongated paragnaths; VII–VIII = 3 rows. There is sometimes an accessory denticle in group V. Tentacular cirri reaching backwards to the 4–5th setigerous segment. Terminal pieces of falcigerous bristles straight and ciliated. Posterior feet not enlarged.

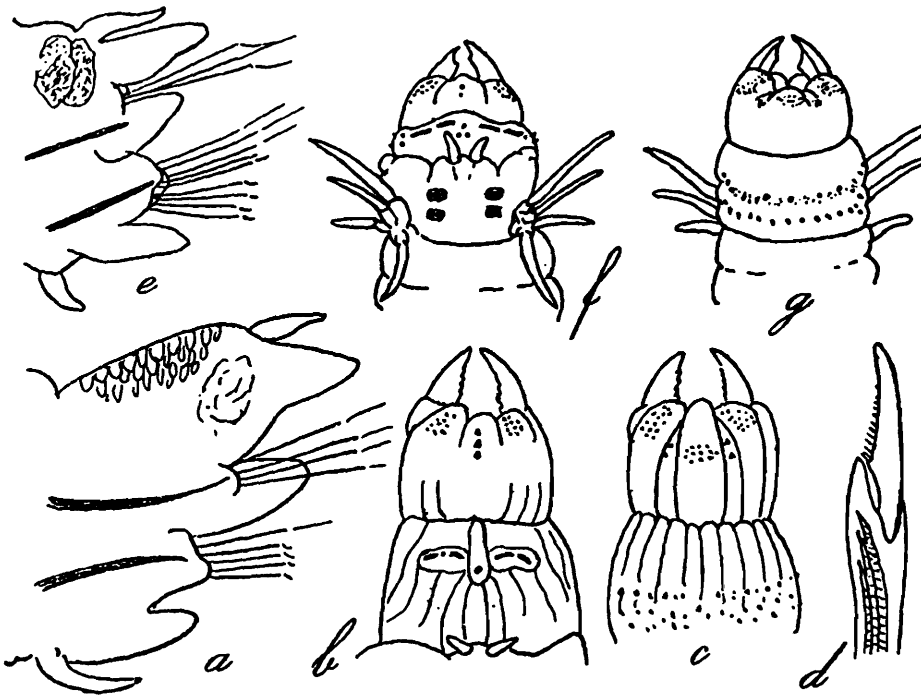


Fig. 105.—*Perinereis singaporiensis* Grube; *a*, posterior foot ×32; *b*, *c*, proboscis, dorsal and ventral view; *d*, ventral falciger ×240 (after Pruvot). *P. suluana* Horst: *e*, foot ×40 (after Horst). *P. vancaurica* (Ehlers): *f*, *g*, head and proboscis (after Monro).

Length: 80 mm. by 3 mm.

Colour: A dark median stripe on anterior segments.

Occurrence: Singapore; Mergui.

Distribution: Philippine Islands, Indo-China, New Zealand; Nankauri, Nicobar Islands, Red Sea; Atlantic Ocean, French Guiana.

191. **Perinereis cultrifera** Grube. (Fig. 106, *a*–*l*).

Perinereis cultrifera, Fauvel, 1923a, p. 352, fig. 137 (Synonymy); 1932, p. 104.
Perinereis floridana Ehlers, Gravier, 1901, p. 185, pl. XI, fig. 48.
Perinereis perspicillata, Grube, 1878, p. 90, pl. IV, fig. 10.
Perinereis striolata, Pruvot, 1930, p. 60.
Perinereis helleri, Grube, 1878, p. 81: Pruvot, 1930, p. 62.
Perinereis camiguina, Grube, 1878, p. 87.
Perinereis obfuscata, Grube, 1878, p. 86: Horst, 1924, 173, pl. XXXIV, figs. 5, 6.

Proboscis: group I = 1, or a few in a line or a small cluster; II and IV=clusters; III=a rectangular cluster; V =I or a triangular patch of 3; VI=on each side, a single broad, flattened paragnath; VII–VIII = 2–3 rows. Tentacular cirri of variable length. Falcigerous setae with short sickle-shaped terminal pieces. Posterior feet not modified.

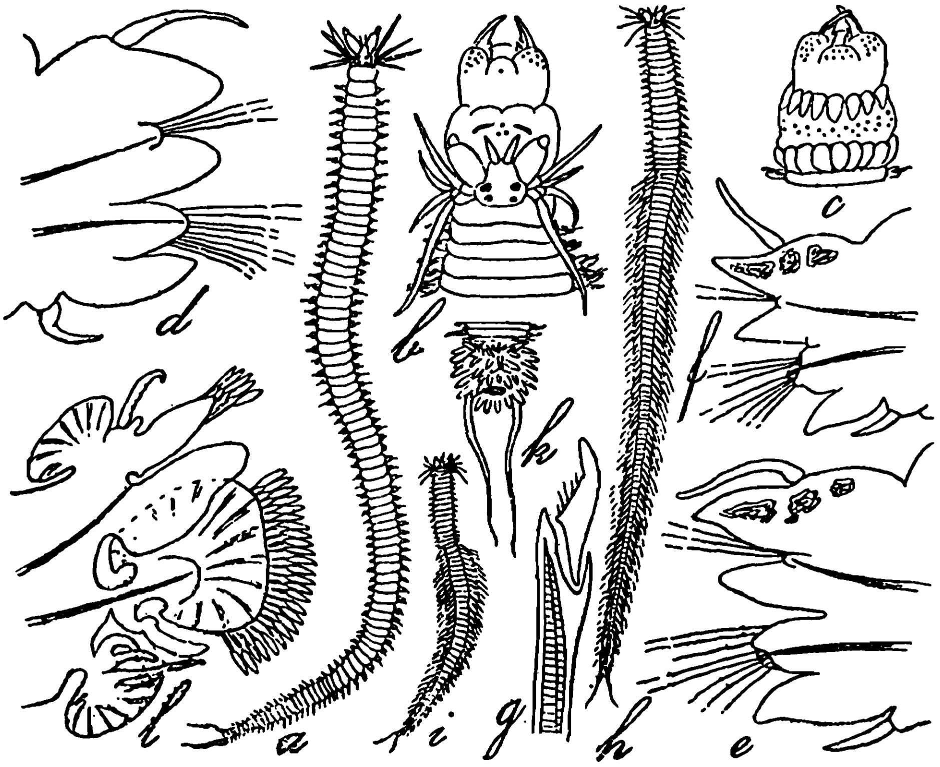


Fig. 106.—*Perinereis cultrifera* Grube: *a,* natural size; *b, c,* head and proboscis, dorsal and ventral view; *d, e, f,* anterior, mid-body and posterior feet ×15; *g,* heterogomph falciger ×270; *h,* female, Heteronereis stage; *i,* male Heteronereis stage; *k,* its pygidium; *l,* male epitocous foot ×20.

Length: 10–250 mm.

Colour: Dark or yellowish green.

This species is liable to extensive variation, especially as regards the armature of the proboscis, the length of the cirri and the shape of the dorsal ligule.

The principal varieties, or sub-species, are tabulated as follows:

Key to the varieties of P. cultrifera Grube.

1. Group V, a triangle of 3 paragnaths	2
Group V, a single paragnath ..	4
2. Group I, 1 to 3 in a longitudinal line	3
Group I, a small cluster of 4–8	*perspicillata* Grube, p. 208.

3. Tentacular cirri reaching backwards to the 5—6th setigerous segment	*cultrifera* var. *typica* Grube, p. 208.
Tentacular cirri reaching backwards to the 7—8th setigerous segment	*helleri* Grube, p. 208.
4. Group I, 1 or 2 in a line	*floridana* Ehlers, p. 208.
Group I, a small cluster of 4—5	5
5. Tentacular cirri reaching backwards to the 3rd setigerous segment	*obfuscata* Grube.
Tentacular cirri reaching backwards to the 9th setigerous segment	*striolata* Grube, p. 209.

var. typica Grube.

Group I = 1—3 in a line; V = a triangular patch of three. Tentacular cirri reaching to the 5—6th segment.

Occurrence: Burma, Diamond Island; Nicobar Islands, Camorta I; Andaman Islands; Cape Comorin.

Distribution: Cosmopolitan; Pacific, Indian and Atlantic Oceans.

var. floridana Ehlers.

Group I = 1—2 in a line; V = a single large paragnath.

Occurrence: Singapore; Cape Comorin.

Distribution: Gulf of Siam; Malay Archipelago; India; Atlantic Ocean.

var. perspicillata Grube.

Group I = a small cluster of 4—8 paragnaths; V = triangle of three.

Occurrence: Indo-China; Singapore; Mormugao Bay

Distribution: Philippine Islands; New Caledonia; Singapore; India; Persian Gulf; coasts of France.

var. helleri Grube.

Perinereis camiguina, Grube, 1878, p. 87: Augener, 1922, p. 23.

Group I = 2, one behind the other; V = a triangular group of 3 large paragnaths. Tentacular cirri reaching backwards to the 8—9th segment.

Occurrence: Mergui Archipelago; Gulf of Mannar; Bombay Harbour.

Distribution: Pacific Ocean, Philippine Islands; India; Atlantic Ocean.

var. **striolata** Grube.

Group I=a small cluster of 4–5; group; V=a single large paragnath. Tentacular cirri reaching backwards to the 9th setigerous segment.

Occurrence: Gulf of Siam; Singapore.

Distribution: Philippine Islands; Indo-China.

Remarks: *Perinereis obfuscata* differs from *P. striolata* in having shorter tentacular cirri.

192. **Perinereis aibuhitensis** Grube. (Fig. 107, *a*).

Perinereis aibuhitensis, Grube, 1878, p. 89, pl. V, fig. 3: Horst, 1924, p. 168, pl. XXXIII, figs. 4–6: Fauvel, 1932, p. 106.

Group I=2 in a line; II and IV=clusters; III=a transverse cluster of 3 rows and, on each side, 3–4 in a longitudinal line; V=3, arranged in a triangle; VI=on each side, two stout obtusely conical, hardly flattened

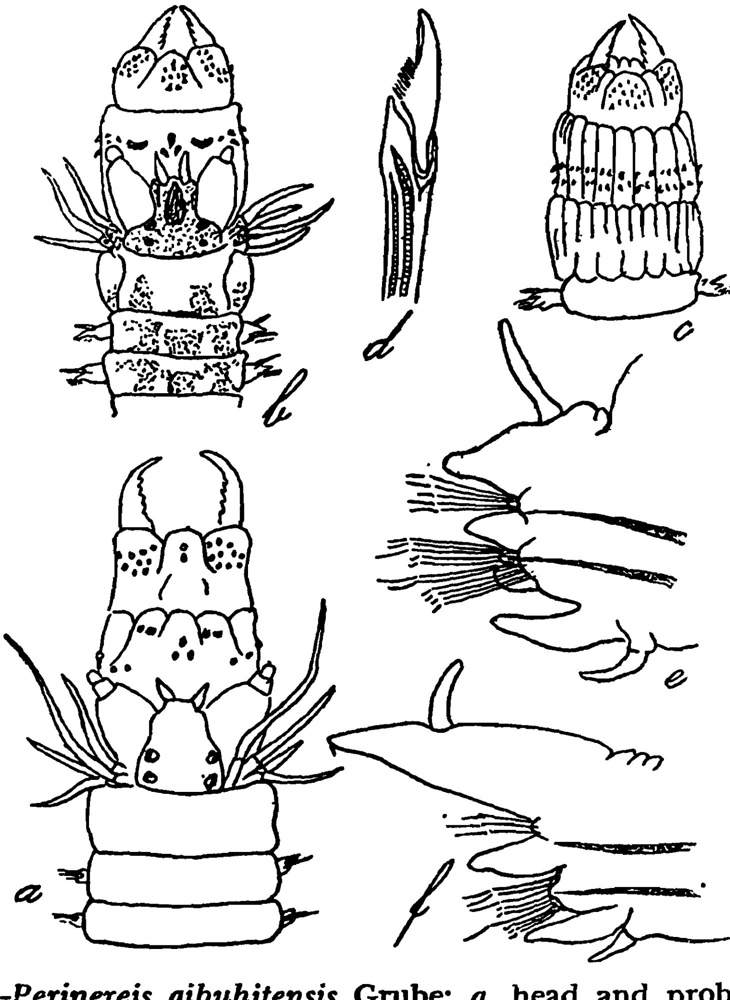


Fig. 107.—*Perinereis aibuhitensis* Grube: *a*, head and proboscis (after Grube). *P. nigropunctata* Horst (=*S. marjorii* Southern): *b, c*, head and proboscis, dorsal and ventral view ×10; *d*, falciger ×500; *e*, 10th foot ×50; *f*, 70th foot ×50 (after Southern).

paragnaths; VII—VIII=3 rows. Falcigerous bristles with long, straight terminal piece. Dorsal ligule of the posterior feet short and thick.

Occurrence: Andaman Islands; Vizagapatam; Mormugao Bay.

Distribution: Philippine Islands; Batavia; Macassar; China; India.

193. **Perinereis nigro-punctata** Horst. (Fig. 107, *b—f*)

Perinereis nigro-punctata, Horst, 1924, p. 171: Fauvel, 1932, p. 107.
Perinereis marjorii, Southern, 1921, p. 595, pl. XXIII, fig. 10.
Perinereis yorkensis, Augener, 1922a, p. 24, fig. 6, *a—e*.

Proboscis: group I=a cluster of 5—12 paragnaths; II and IV=triangular and crescentic clusters; III=a transverse group; V=2 large denticles arranged in a triangle; VI=on each side, a single, large, semi-circular tooth; VII—VIII a double row. Falcigerous bristles with short sickle-shaped terminal piece. Dorsal ligule greatly enlarged in the posterior feet.

Length: 50—60 mm. by 2—3 mm.

Colour: Pale purplish brown. A V-shaped band behind the eyes. Three transverse black spots on the back of the anterior segments.

Occurrence: Nicobar Islands, Nankauri; Andaman Islands; Chilka Lake; Cape Comorin.

Disribution: Malay Archipelago; Nicobar Islands, Nankauri; India.

194. **Perinereis cavifrons** Ehlers. (Fig. 108, *a—b*)

Nereis (Perinereis) cavifrons, Ehlers, 1920, p. 47, pl. I, fig. 6—10.

Proboscis: group I=2—3, one behind the other; II and IV=crescentic clusters; II=a cluster; V=0; VI=on each side, a rather narrow transverse paragnath; VII—VIII =2 or 3 irregular rows. Tentacular cirri reaching backwards to the 6th segment. Dorsal cirri about the length of the dorsal ligule. Posterior feet not modified. Falcigerous bristles with short terminal piece.

Occurrence: Gangetic delta; coast of Travancore; Mormugao Bay.

Distribution: Java; Burma; India.

195. **Perinereis neocaledonica** Pruvot. (Fig. 108, *c–g*)
Perinereis neocaledonica, Pruvot, 1930, p. 50, pl. III, figs. 77–79: Fauvel, 1932, p. 107.

Body of large size, about 300 segments. Prostomium broader than long, notched between the tentacles. Palps short, globular. Proboscis: groups I and II *are missing;* III–IV=a dense cluster of very numerous and very minute denticles, the three groups nearly coalescent; V=1, 2 or 3 large paragnaths; VI=on each side, a transverse row of about 20 conical or slightly flattened paragnaths; VII–VIII=a belt of numerous very small denticles reaching to the groups VI. A similar patch of small denticles,

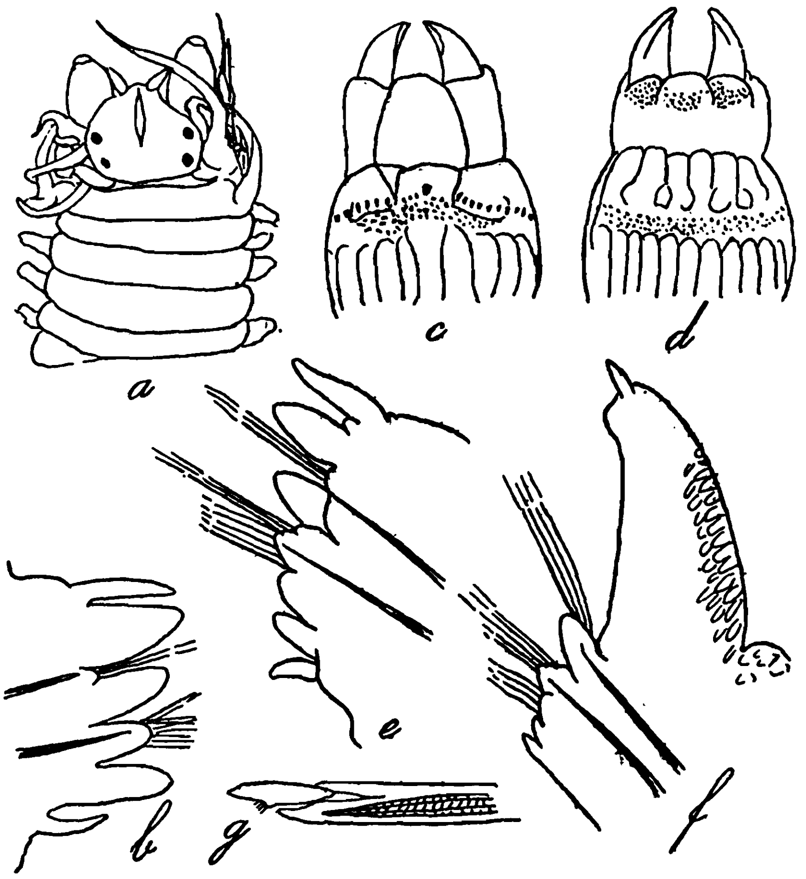


Fig. 108.—*Perinereis cavifrons* Ehlers: *a,* anterior part ×4; *b,* 10th foot ×18 (after Ehlers). *P. neocaledonica* Pruvot: *c, d,* proboscis, dorsal and ventral view; *e,* 16th foot ×30; *f,* hinder foot ×30; *g,* heterogomph falciger ×175 (after Pruvot).

sometimes continuous with the former, lies behind the large paragnaths of group V. Jaws large, dark and smooth. Tentacular cirri very short. Dorsal cirri short. In the anterior feet, dorsal ramus with two ligules. Dorsal ligule of the posterior feet much enlarged, flag-like, with a small dorsal cirrus inserted near the tip. Heterogomph falcigerous bristles with a large shaft and a and a small terminal piece, easily deciduous.

Length: 175—220 mm. by 6 mm., setae included.

Colour: Yellowish, in spirit, with traces of a longitudinal chestnut streak.

Occurrence: North Andaman Islands, under stones; Arabian Sea.

Distribution: New-Caledonia; New-Hebrides; Andaman Islands; Arabian Sea.

196. **Perinereis** nuntia (Savigny) (Fig. 109, *a*—*g*)

Perinereis nuntia, Fauvel, 1919, p. 410 (Synonymy); 1932, p. 108.

Proboscis: Group I=0, or 1 to 3 behind one another; II=clusters; III=rectangular patch; IV=triangular clusters; V=0, 1, 2 or 3 set in a triangle; VI=on each side, a single curved row of 5—18 conical, or flattened, or conical and flattened mixed together; VII—VIII=3 rows of large spikes, more or less flattened and, sometimes, 2—3 rows of smaller ones. Tentacular cirri reaching backwards to the 3rd—16th setigerous segment. Dorsal cirri of variable length. Parapodia with dorsal ligules blunt, conical, or tapering. In the posterior feet, the dorsal ligule is enlarged.

This wide-spread species, fairly common in warm seas all over the world, is also liable to extensive variations, and has been described under many names.

These varieties may be tabulated as follows:

Key to the varieties of P. nuntia Savigny.

1. Group V missing	3
Group V present	2
2. Group V, 1 paragnath ..	4
Group V, 3 in a triangle	5
3. Tentacular cirri reaching backwards to the 10—15th segment; dorsal cirri longer than the dorsal ligule; paragnaths of VI mixed ..	var. *djiboutiensis* Fauvel.
Tentacular cirri reaching to the 3rd—5th segment; dorsal cirri shorter than the dorsal ligule; paragnaths of VI flattened	var. *heterodonta* Gravier, p. 214.
4. Group I, 1—3 ..	var. *vallata* (Grube), p. 215.
Group I, 7—13 ..	var. *majungaensis* Fauvel.
5. Tentacular cirri reaching to the 10—16th segment. Paragnaths of group VI all conical	var. *typica* Savigny, p. 213.

Tentacular cirri reaching to the 7th—8th segment. Paragnaths of group VI flattened or mixed .. var. *brevicirris*, (Grube), p. 214.

var. typica (Fig. 109, *f—g*).

Lycoris nuntia, Savigny, 1920, p. 33, pl. IV, fig. 2.
Neanthes nuntia, Gravier, 1901, p. 164: Fauvel, 1911, p. 382.
Perinereis nuntia, Fauvel, 1919, p. 415 (Synonymy); 1932, p. 109.

Proboscis: group I=0, 1 or 2; II—IV=clusters; III= a rectangular patch; V=3 set in a triangle; VI=on each

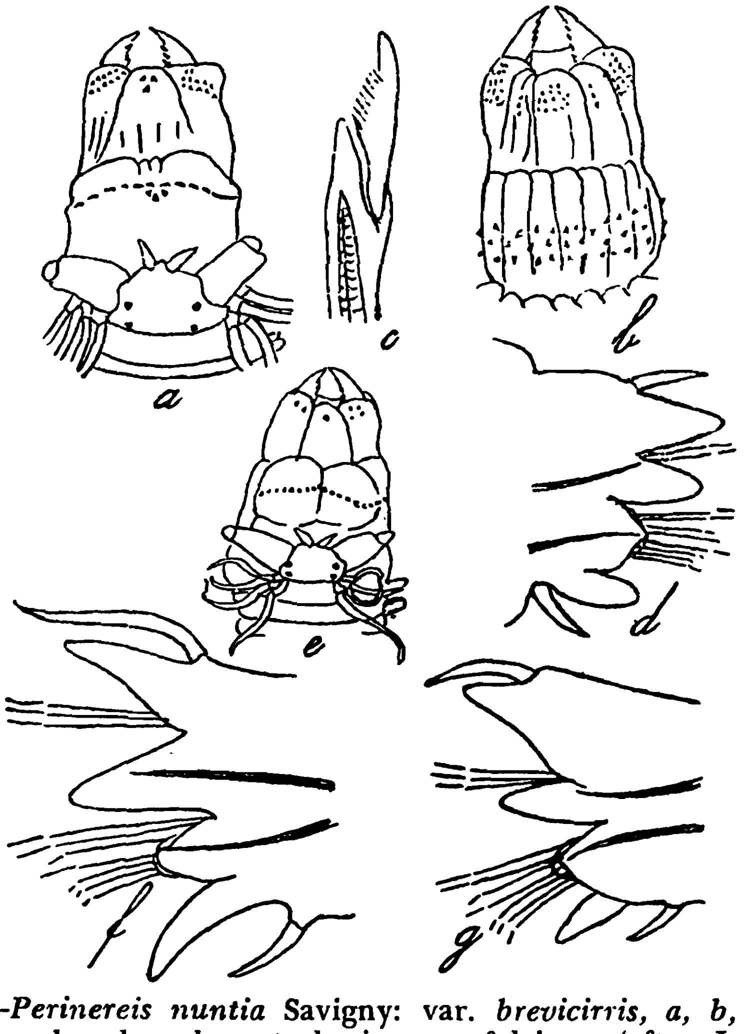


Fig. 109.—*Perinereis nuntia* Savigny: var. *brevicirris*, *a*, *b*, head and proboscis, dorsal and ventral view; *c*, falciger (after Izuka); *d*, 40th foot. var. *heterodonta*: *e*, proboscis (after Gravier), var. *nuntia*: *f*, *g*, mid-body and hinder feet.

side, a curved row of 5—12, conical; VII—VIII=2 anterior rows of large ones and 2—3 rows of smaller ones. Tentacular cirri and dorsal cirri long. Dorsal ligules pointed.

Length: 70—150 mm. by 3—4 mm.

Occurrence: Nicobar Islands, Nankauri; Orissa coast; Gulf of Mannar, Tuticorin, Pamban; Bandra, near Bombay.

Distribution: Indian Ocean, Persian Gulf, Red Sea.

var. **brevicirris** (Grube). (Fig. 109, *a–b*)

Nereilepas brevicirris, Grube, 1867, p. 19, pl. II, fig. 2.

Nereis mictodonta, Marenzeller, 1879, p. 118, pl. II, fig. 2: Izuka, 1912, p. 148, pl. XVI, fig. 1–6.

Perinereis mictodonta var. *mictodontoides*, Augener, 1915, p. 177.

Pernereis nuntia var. *brevicirris*, Fauvel, 1932, p. 110.

Proboscis: group I=1 to 3; II and IV=crescentic and triangular clusters; III= a rectangular patch with 2–3 denticles, on each side; V=3, set in a triangle (sometimes 4); VI=on each side a transverse row of 8–10 conical or flattened, more or less mixed together; VII–VIII=3 irregular rows, and, sometimes, a few more. Tentacular cirri reaching to the 5th–8th segment. Dorsal cirri short. Dorsal ligules blunt, conical.

Length: 65–140 mm. by 2–3 mm.

Occurrence: Nicobar Islands, Nankauri; Gulf of Mannar; Tuticorin, Cape Comorin; Bombay.

Distribution: Japan; Australia; New-Caledonia; Malaya Archipelago; Indian Ocean; Saint Paul Island; Nicobar Islands; India; Red Sea.

var. **heterodonta** Gravier. (Fig. 109 *e*).

Perinereis heterodonta, Gravier, 1901, p. 179, pl. XI, fig. 46.

Perinereis heterodonta, Fauvel, 1911, p. 394.

Perinereis nuntia var. *heterodonta*, Fauvel, 1919, p. 419; 1932, p. 110.

Proboscis: group I=1 or 2; II=2–6 very small; III–IV=irregular clusters; V=0; VI=on ecah side, a row of 10–18 flattened, cutting; VII–VIII=3 irregular rows of large flattened spikes. Tentacular cirri reaching to the 3rd–6th segment, or more. Dorsal cirri short. Dorsal ligules blunt, conical.

Length: 70–100 mm. by 2–3 mm.

Occurrence: Persian Gulf.

Distribution: Persian Gulf; Red Sea.

var. vallata (Grube)

Nereis vallata, Grube, 1857, p. 159: Ehlers, 1901, p. 110.

Neanthes latipalpa Kinberg, Willey, 1905, p. 200, pl. XIII, fig. 9.

Lycoris quatrefagesi, Grube, 1878, p. 79.

Perinereis nuntia var. *vallata*, Fauvel, 1919, p. 418 (Synonymy); 1932, p. 110: Augener, 1913, p. 175.

Proboscis: group I=1–3; II–III–IV=clusters; V=I, set far back; VI=on each side a transverse row of 8–15 paragnaths, conical, flattened, or both mixed together; VII–VIII=3 alternate rows of spikes somewhat flattened. Tentacular cirri reaching to the 3rd–6th segment. Dorsal cirri short, dorsal ligules blunt.

Length: 50–80 mm.

Occurrence: Bombay, under rocks, in sand.

Distribution: Chile; New-Zealand; Australia; Philippine Islands; India, Red Sea, Madagascar, Cape of Good Hope.

Genus PSEUDONEREIS Kinberg.

Paragnaths of the proboscis of three kinds: conical, pectinate and transverse. Posterior feet enlarged.

Key to the species of Pseudonereis Kinberg.

1. Group VI, on each side, a single broad flattened paragnath	*gallapagensis* Kinberg, p. 215.
Group VI, on each side, one or several rows of paragnaths ..	2
2. Posterior dorsal homogomph falcigerous bristles present	*anomala* Gravier, p. 217.
Posterior dorsal homogomph falcigerous bristles absent	*rottnestiana* Augener, p. 217.

197. Pseudonereis gallapagensis Kinberg. (Fig. 110, *a–c*)

Pseudonereis gallapagensis, Kinberg, 1857–1910, p. 52, pl. XX, fig. 3: Gravier, 1909, p. 629, pl. XVI, figs. 15–20: Fauvel, 1932, p. 111.

Paranereis elegans, Kinberg, 1857–1910, p. 53, pl. XX, fig. 8.

Pseudonereis variegata, Fauvel, 1921, p. 13 (Synonymy).

Pseudonereis ferox Hansen, Fauvel, 1914, p. 120, pl. VII, figs. 13–17.

Nereis longicirra (Schmarda), Michaelsen, 1892, p. 9, pl. I, fig. 9–10.

Mastigonereis longicirra, Schmarda, 1861, p. 109, pl. XXXI, fig. 250.

Proboscis: group I=1–2; II–III=dense rows of small pectinate paragnaths; IV=rows of pectinate denticles and a few conical paragnaths in front; V=1; VI=, on each side, a single large, triangular or flattened paragnath; VII–VIII=two rows of laterally or longitudinally flattened spikes alternating. Tentacular cirri reaching backwards to the 3rd–8th segment. Falcigerous setae without sickle-shaped terminal piece. Homogomph dorsal falcigerous bristles absent. Dorsal ligule of the posterior feet enlarged.

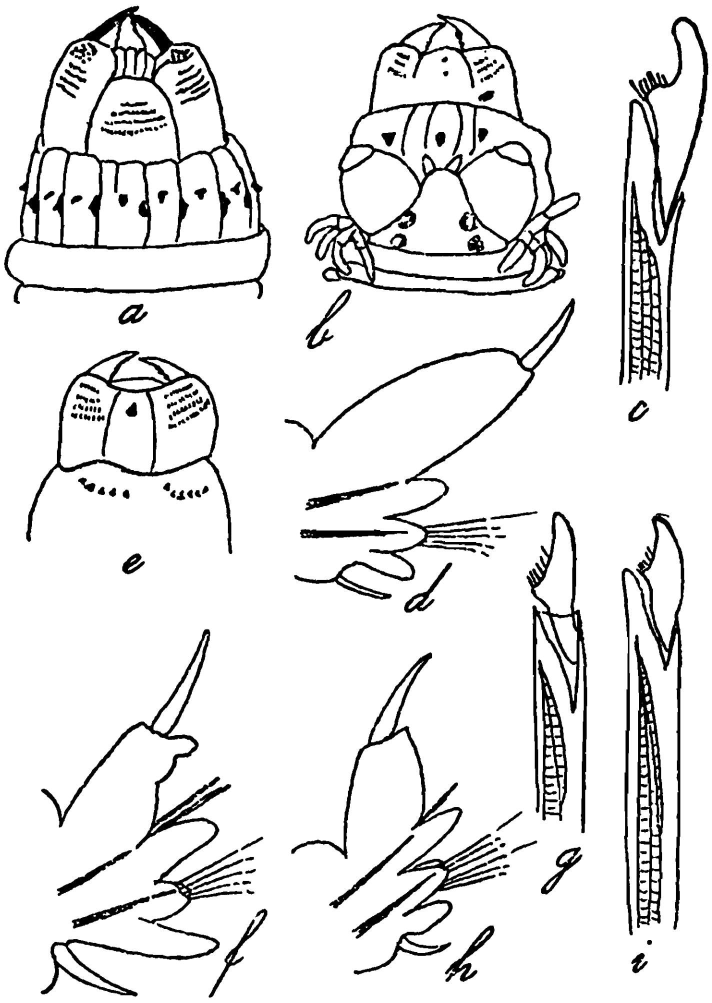


Fig. 110.—*Pseudonereis gallapagensis* Kinberg: *a, b,* head and proboscis, ventral and dorsal view; *c,* falciger (after Gravier). *Ps. anomala* Gravier: *e,* proboscis, dorsal view; *f,* posterior foot ×44; *g,* dorsal homogomph falciger ×300. *Ps. rottnestiana* Augener: *h,* posterior foot ×44; *i,* ventral falciger ×300.

Length: 20–65 mm. by 3–5 mm.

Colour: In life bluish-grey; in spirit, dark-brown with blue iridescence.

Occurrence: Andaman Islands; Diamond Island; Mormugao Bay.

Distribution: Pacific Ocean, Gallapagos, Peru, Chile, Magellan, Indo-China; Indian Ocean, India, Madagascar, Cape of Good Hope; Atlantic Ocean, Cameroon, San-Thome, Brazil.

198. **Pseudonereis anomala** Gravier. (Fig. 110, *e—g*)

Pseudonereis anomala, Gravier, 1901, p. 191, pl. XII, fig. 50—52: Fauvel, 1911, p. 395; 1932, p. 112: Gravely, 1927, p. 15, pl. X, fig. 25.

Proboscis: group I=1—3; II—III—IV=several rows of small pectinate paragnaths; V=0; VI=, on each side a transverse row of 6—10 conical paragnaths; VII—VIII= a single row of large paragnaths, more or less flattened. Tentacular cirri long. Posterior dorsal ligules elongated, with dorsal cirrus near the tip. Posterior dorsal falcigerous bristles, with rather short, faintly curved, terminal piece.

Length: 20—65 mm.

Occurrence: Andaman Islands; Gulf of Mannar; Cape Comorin; Kilakarai; Mormugao Bay.

Distribution: Australia, Malay Archipelago, Indo-China; India, Arabian Sea, Persian Gulf, Red Sea, Madagascar.

199. **Pseudonereis rottnestiana** Augener. (Fig. 110, *h, i*)

Pseudonereis rottnestiana, Augener, 1913, p. 184, fig. 20, *a—c*, pl. III, fig. 46: Fauvel, 1932, p. 112.

Proboscis: group I=0, 1 or 2; II—III=4—5 rows of pectinate denticles; IV=4—5 rows of pectinate denticles and a few conical paragnaths in front; V=0; VI=on each side, a transverse row of 6—10 conical paragnaths; VII—VIII=two alternating rows. Tentacular cirri reaching backwards to the 6th—9th setigerous segment. Dorsal ligule of the posterior feet enlarged, with dorsal cirrus near the tip. Falcigerous bristles with short, sickle-shaped, terminal piece. Homogomph dorsal falcigerous bristles absent.

Length: 25—35 mm. by 2—3 mm.

Colour: Head dark coloured, body pale yellow-ochre.

Occurrence: Andaman Islands.

Distribution: South Australia; Andaman Islands.

Genus PLATYNEREIS Kinberg.

Horny paragnaths arranged in pectinate rows of minute denticles. All dorsal groups on the maxillary

ring, and at least the mid-dorsals (sometimes all, both dorsal and ventral) on the oral ring generally missing.

Key to the species of Platynereis.

1. Dorsal cirrus of the 7th setigerous segment much longer than the others ..	*abnormis* (Horst), p. 222.
Dorsal cirrus of the 7th setigerous segment normal	2
2. *Heteronereis* stage with oar-shaped setae all compound and not conspicuously pectinate ..	3
Heteronereis stage with pectinate oar-shaped setae, and single setae in the last segments	4
3. Group II absent	*dumerilii* (Aud. & M.-Edwards), p. 218.
Group II present	*fusco-rubida* Grube, p. 219.
4. Oar-shaped setae boldly pectinate ..	*polyscalma* Chamberlin, p. 221.
Oar-shaped setae faintly pectinate. Stout hooks in the anterior and posterior feet	*pulchella* Gravier, p. 220.

200. **Platynereis dumerilii** (Aud. & M.-Edwards.) (Fig. 111, *a—f*)

Platynereis dumerilii, Fauvel, 1923a, p. 359, fig. 141; 1932, p. 113.
Platynereis insolita, Gravier, 1901, p. 197, pl. XII, fig. 53: Gravely, 1927, p. 16, pl. X, fig. 23.
Platynereis bengalensis Kinberg, Willey, 1905, p. 273, pl. IV, fig. 92—94.

Proboscis: paragnaths very minute, often pale and little conspicuous. Group I=0; III=0; III=a small transverse cluster in two rows; IV=several transverse pectinate rows; V=0; VI=on each side, 1—2 concentrtic curved rows; VII—VIII=5—7 clusters of small pale denticles (very variable). Tentacular cirri long, extending to the 10th—15th setigerous segment. Posterior feet not enlarged. Falcigerous bristles with short, hooked, sickle-shaped terminal pieces. Dorsal homogomph falcigerous setae with more elongated terminal piece in the posterior feet.

Length: 20—60 mm.

Colour: In life very variable, greenish, yellowish, pink, reddish, with violet chromatophores and dark pedal glands.

Occurrence: Andaman Islands; Nicobar Islands, Nankauri; Gulf of Mannar; Madras Coast; Pamban; Ceylon.

Distribution: Cosmopolitan; Pacific, Indian and Atlantic Ocean.

201. Platynereis fusco-rubida Grube.

Nereis (*Platynereis*) *fusco-rubida*, Grube, 1878, p. 70: Fauvel, 1911, p. 403.

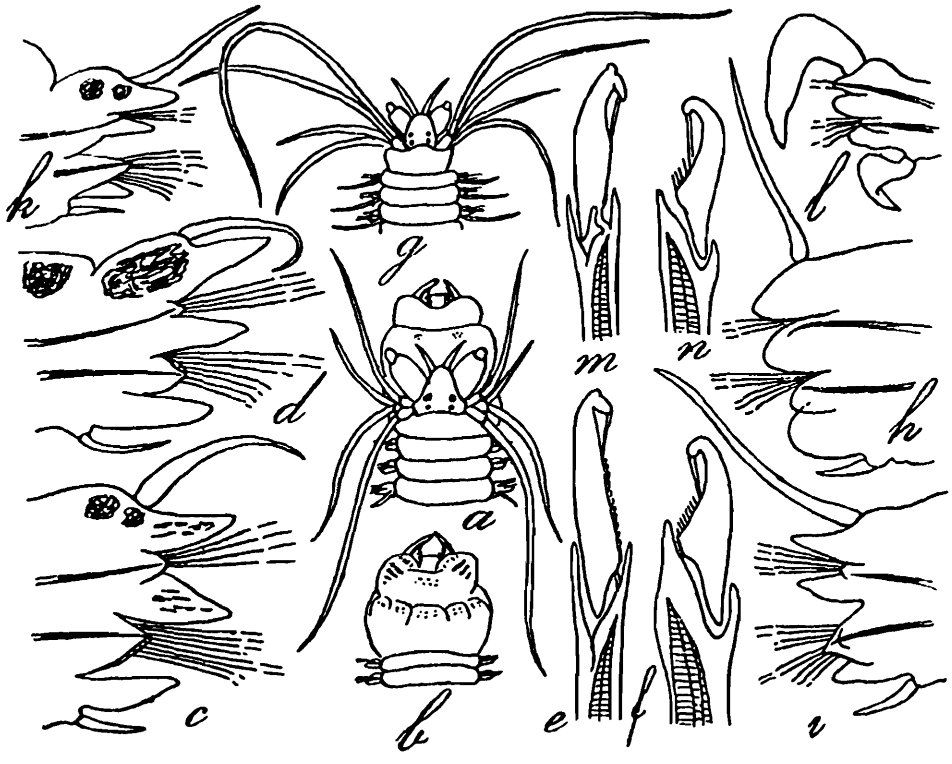


Fig. 111.—*Platynereis dumerilii* Aud. & M.-Edw.: *a, b*, head and proboscis; *c*, foot from mid-body ×30; *d*, posterior foot ×30; *e*, dorsal homogomph falciger ×350; *f*, ventral heterogomph falciger ×350. *Pl. coccinea* Delle Chiage: *g-n*, (not yet found in the Indian area).

In the atocous condition this species is very close to *Pl. dumerilii*. The chief differences lie in the armature of the proboscis. *There is a small row of paragnaths in the groups II*, which are missing in *Pl. dumerilii*, and in groups VI a rectangular cluster, instead of the usual two rows. Such slight differences are hardly of specific value but, on the other hand, the proboscis agrees tolerably well with that of *Pl. polyscalma*, whose atocous condition is still unknown. *Pl. fusco-rubida* might, perhaps, be this atocous condition, as *Pl. pulchella* is the atocous condition of a *Heteronereis* quite distinct from *Pl. dumerilii*.

Length: 20—50 mm.

Colour: Dark pedal glands.

Occurrence: Persian Gulf.

Distribution: Philippine Islands; Persian Gulf.

202. Platynereis pulchella Gravier. (Fig. 112, *f—h*).

Platynereis pulchella, Gravier, 1901, p. 202, figs. 55—56, pl. XII, figs. 210—212: Monro, 1936, p. 380, fig. 1—3; 1937, p. 279, fig. 10: Fauvel, 1939, p. 329.

Platynereis dumerilii var. *pulchella,* Fauvel, 1911, p. 402, figs. 30—32.

In the atocous condition this species is so close to *Pl. dumerilii* that I considered it as a simple variety characterised by a *single row of paragnaths in the groups VI,* instead of two, and by slightly different falcigers. In all but a few anterior segments, there are one or four dorsal

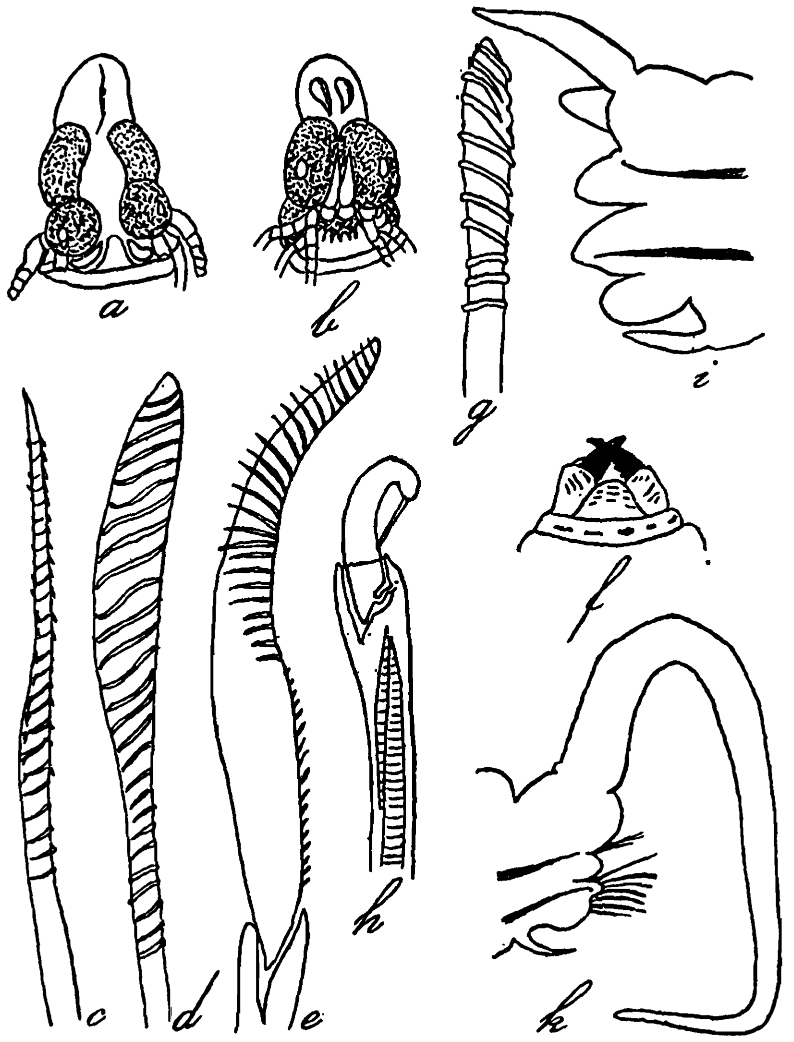


Fig. 112.—*Platynereis polyscalma* Chamberlin: *a, b, Heteronerest* stage, anterior part, dorsal and ventral view (after Horst); *c,* simple bristle from the last segment ×270; *d,* simple ribbed bristle from terminal segments ×270; *e,* swimming bristle ×270. *Pl. pulchella* Gravier: *f,* ventral view of the proboscis; *g,* simple ribbed bristle (after Monro); *h,* dorsal homogomph falciger from anterior foot ×380. *Pl. abnormis* (Horst): *i,* 7th foot of the female ×50; *k,* 7th foot of the male ×50 (after Horst).

homogomph falcigers, the terminal piece with downward curved, smooth tip and conspicuous terminal ligament having its basal attachment as far down as the tip of the articular cup.

But the epitocous condition is quite different from *Pl. dumerilii* and close to that of *Pl. polyscalma,* differing only in the *presence of the said dorsal homogomph falcigers in the last segments of the anterior part* and in the blades of the swimming bristles whose fringes are very fine and difficult to see, and, last, the terminal, simple, ribbed bristles are finer.

Length: 15–30 mm. *Heteronereis* stage, about 15 mm., male with two regions.

Occurrence: Andaman Islands; Nicobar Islands, Nankauri.

Distribution: Indo-China; Bay of Bengal, Arabian Sea, Persian Gulf, Red Sea.

203. **Platynereis polyscalma** Chamberlin. (Fig. 112, *a–e*)

Platynereis polyscalma, Chamberlin, 1919, p. 219, pl. XXX, XXXI: Horst, 1924, p. 186; Fauvel 1931, p. 23, pl. III, figs. 1–6; 1932, p. 114; 1935, p. 323; 1939, p. 329: Gravier and Dantan, 1934, p. 121, figs. 123–124: Monro, 1935, p. 125.
(?) *Platynereis integer,* Treadwell, 1920, p. 595, fig. 4.

Atocous condition still unknown. *Heteronereis* stage: Prostomium snout-like, protruding, broadly rounded in front. Tentacles small, ventral, pointing backwards; the palps have a similar disposition, but concealed under the head and lowered over the mouth. Four enormous eyes with lenses, the anterior pair much larger than the posterior and nearly ventral in position. Proboscis: group I=0; II=chitinous areas destitute of paragraphs; III=pectinate cluster; IV=crescentic clusters of small pectinate denticles; V=0 (or 1?); VI=on each side a round or oval cluster of pectinate paragnaths; VII–VIII a row of several oval clusters. Tentacular cirri reaching backwards to the 6th–9th segment. Anterior dorsal cirri of the male swollen, the succeeding ones crenulated. Two large anal cirri with a filiform tip and a rosette of papillae. Swimming bristles compound, with long oval blades, bearing, on one side, below the apex, very long and spine-like delicate marginal teeth projecting at an angle. In the last segments simple setae with a ribbed blade.

In the male specimens, the epitocous transformations commence on the 15th setigerous segment. The inferior

ventral ligule has three processes and the dorsal lamella of the ventral cirrus is bifurcated. The last 15–16 segments resemble a kind of narrow, slender, tail but the appearance is rather delusive as all these segments are provided with epitocous bristles and lamellae, only the ventral division is much smaller. The anus is surrounded by a rosette of minute hollow papillae and the pygidium bears two anal filiform cirri.

As already stated, it might be, perhaps, the epitocous condition of *Pl. fusco-rubida.*

Length: 10–20 mm.

Occurrence: Nicobar Islands, Nankauri Harbour; Andaman Islands, in plankton.

Distribution: Funafuti, Gilbert Islands (Philippine Islands?), Java, Weiu Island, Indo-China, Gulf of Siam; Nicobar Islands, Andaman Islands.

204. Platynereis abnormis (Horst) (Fig. 112, *i–k*)

Nereis abnormis, Horst, 1924, p. 163, pl. XXXII, fig. 6: Augener, 1926b, p. 448: Fauvel, 1930, p. 23.

Platynereis abnormis, Fauvel, 1932, p. 113.

Proboscis: Group I=0; II=a small concave row of paragnaths; III=0; IV=a crescentic row of paragnaths; V=0; VI=a triangular row of paragnaths; VII–VIII=five small, transverse groups of paragnaths, three of them in the median part and one on each side. Tentacular cirri long. *A very long dorsal cirrus on the 7th setigerous segment.* Falcigerous setae with sickle-shaped terminal pieces bent in the form of a hook with a dorsal prominence. Posterior dorsal homogomph falcigerous bristles.

The atocous specimens resemble *Pl. dumerilii* except in the characteristic, very long, dorsal cirrus of the 7th setigerous segment. The falcigers are also alike. The mutation of the feet occurs about the 14th to 15th feet in the male and 16th in the female, according to Augener. In *Heteronereis* stages from Trincomali he noticed three regions; an anterior of 14 segments, with a long cirrus on the seventh, a middle one of 43, and a posterior, atocous, of 11 segments. Moreover, he mentions two other long filiform cirri on the eighth segment of the *posterior* region.

Length: male *Heteronereis,* 10 mm.

Occurrence: Trincomali; Krusadai; Pamban; from weeds.

Distribution: Malaya Archipelago; Ceylon.

Incertae Sedis—

205. **Nereis** (s. str.) sp. m. ezoensis Izuka, Gravely, 1927, p. 13, pl. X, fig. 22.

Does not agree with Izuka's species, and description insufficient for identification.

206. **Nereis ehlersiana** Grube, Willey, 1905, p. 272.

A male *Heteronereis* stage, which cannot be identified (Ceylon)

207 **Nereis festiva** Grube, 1874, p. 326.

A *Platynereis* spec. from Ceylon.

208. **Nereis foliosa** Schmarda, 1861, p. 104, pl. XXXI, fig. 243.

Very likely an *Eunereis* spec. from Ceylon.

209. **Nereis** spec., Fauvel, 1932, p. 116.

A small *Heteronereis,* perhaps related to *N. jacksoni* Kinberg or *kauderni* Fauvel, from Pamban.

Family NEPHTHYDIDAE Grube.

Body elongate, subtetragonal in cross section. Segments short and numerous. Prostomium small, flattened, polygonal. Four small tentacles. Proboscis with terminal bifid papillae and longitudinal rows of soft papillae. Two horny jaws inside the pharynx. First foot rudimentary. Parapodia biramous, both divisions wide apart, provided with membranous lobes and simple setae; a branchia coiled between the rami: a single anal cirrus.

Genus NEPHTHYS Cuvier.

The characters of this genus are those of the family.

Key to the species of Nephthys.

1. Proboscis devoid of papillae	*inermis* Ehlers, p. 224.
Proboscis with papillae	2
2. Branchiae long, slender, coiled	3
Branchiae short, falciform or foliaceous	4
3. Ventral ligule cirriform, gill-like. Bifurcate lyriform setae present	*dibranchis* Grube, p. 225.
Ventral ligule not gill-like. Bifurcate lyriform setae absent	*malmgreni* Theel, p. 226.

4. Posterior bristles boldly serrated	*gravieri* Augener, p. 226.
Posterior bristles long, slender, capillary	5
5. Branchiae missing in the posterior half of the body	*oligobranchia* Southern, p. 228.
Branchiae present in the posterior part of the body	*polybranchia* Southern, p. 227.

210. Nephthys inermis Ehlers. (Fig. 113, *a–f*)

Nephthys inermis, Ehlers, 1887, p. 125, pl. XXXVIII, figs. 1–6; Fauvel 1923a, p. 375, fig. 147; 1933, p. 47, fig. 3 *a–d*: Monro, 1937, p. 283.

Prostomium square, with two anterior, very short, button-like tentacles and two posterior very minute tentacles at the hind part, in front of two very small eyes. Proboscis utterly devoid of papillae, with a pair of

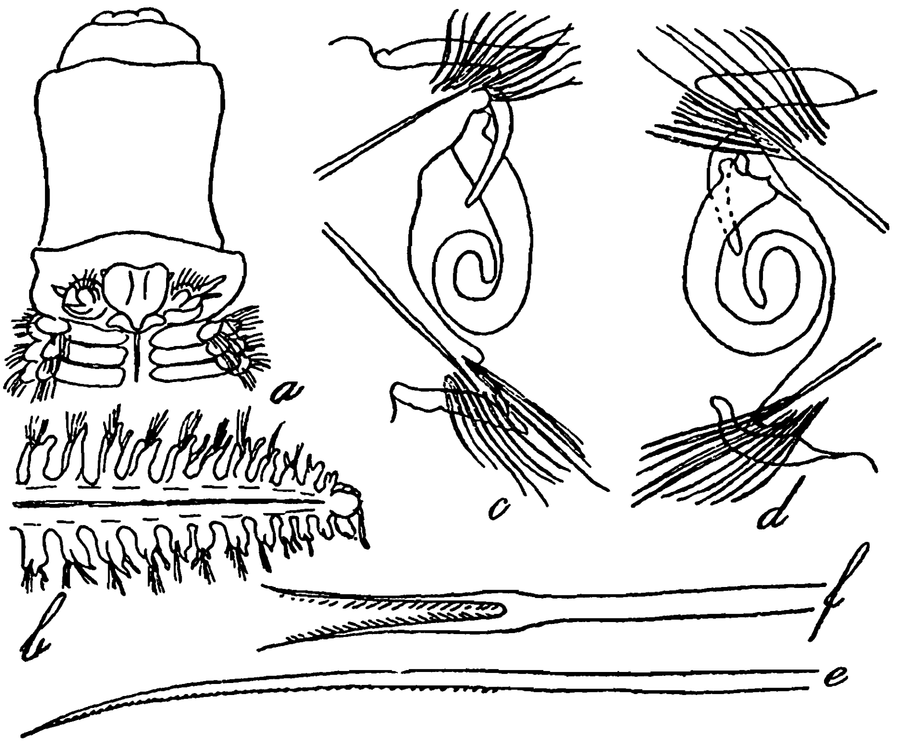


Fig. 113.—*Nephthys inermis* Ehlers: *a,* head and proboscis ×16; *b,* posterior part of the body ×16; *c,* 95th foot ×25; *d,* 45th foot ×25; *e,* simple bristle ×370; *f,* forked, lyriform bristle ×370.

triangular chitinous jaws inserted very far back in the pharynx. Dorsal and ventral rami widely apart and short, with conical setigerous lobes, a digitiform dorsal cirrus, a gill, coiled inwards, a short dorsal lamella, and a rather long ventral cirrus. Anterior setae ciliated, but not camerated. Posterior setae of two kinds: (1) long, slender, faintly denticulate, and (2) *short, bifurcate, lyriform.*

Length: 60–80 mm.; 160 segments.

Occurrence: Maldive Archipelago.

Distribution: Indian Ocean, Maldive Archipelago, South Coast of Arabia, Aden, Gulf of Suez; Atlantic Ocean, Gulf of Mexico, Adriatic Sea.

221. **Nephthys dibranchis** Grube. (Fig. 114, *e*)

Nephthys dibranchis, Grube, 1877, 536: Ehlers, 1904, p. 14: Augener, 1924, p. 297; 1927a, p. 116: Mcintosh, 1885, p. 161, pl. XXVI, figs. 8, 9, pl. XXVII, fig. 5: Fauvel, 1932, p. 117: Monro, 1937, p. 288.

Nephthys spiribranchis, Ehlers, 1917, p. 235; pl. XVI, figs. 5–7.

Branchiae from the fifth setigerous segment, reduced or missing in the posterior segments. In the segments of the mid-body they are long, coiled inwards, with a long dorsal cirrus. Setigerous lobe conical, lamellae short, a long, slender, gill-like ventral ligule and a short ventral

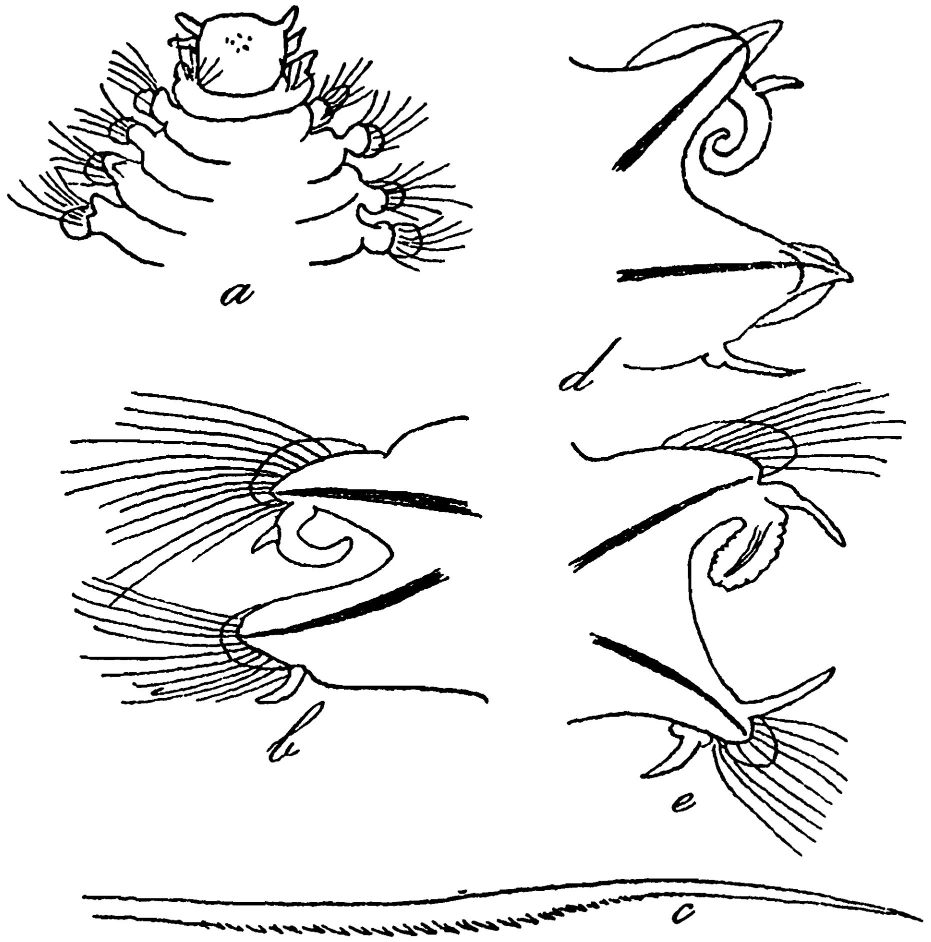


Fig. 114.—*Nephthys gravieri* Augener: *a*, anterior part ×40 after Augener); *b*, foot ×66; *c*, bristle from posterior row of the foot ×330. *N. malmgreni* Theel: *d*, foot ×66. *N. dibranchis* Grube: *e*, foot ×40.

cirrus. Setae long, slender, and also bifurcate, lyriform, bristles.

Length: 20—30 mm. by 2 mm.

Colour: Whitish or pink.

Occurrence: Orissa Coast, Vizagapatam, Madras, Maldive and Laccadive Islands, Gulf of Oman, Persian Gulf.

Distribution: New Zealand; New Guinea; Australia; Arafura Sea; India, Laccadive Sea, Arabian Sea, Gulf of Oman, Persian Gulf; South America.

212. **Nephthys gravieri** Augener. (Fig. 114, *a—c*)

Nephthys gravieri, Augener, 1913, p. 123, fig. 6, pl. II, fig. 5; 1927a, p. 116: Fauvel, 1932, p. 118.

Setigerous lobes conical, blunt, anterior lamellae missing or much reduced, dorsal posterior lamella oval, ventral larger and more rounded. Branchiae broad, short, oval, with a small dorsal cirrus and a bent process at its base. Anterior bristles barred and short, posterior ones very long, boldly serrated on the concave border.

Length: 25—30 mm.

Colour: Yellowish or pink.

Occurrence: Off Puri, Orissa, Bay of Bengal, 847 fms.

Distribution: South Australia; Bay of Bengal.

213. **Nephthys malmgreni** Theel. (Fig. 114, *b, d*)

(?) *Nephthys malmgreni* Theel, Fauvel, 1923a, p. 371, fig. 145.

The ventral cirrus of the first foot is longer than the posterior tentacles, the dorsal one is very small. Dorsal and ventral setigerous lobes sharp and conical, the dorsal and ventral anterior lamellae are mere rounded folds, shorter than the foot, the posterior lamellae are only a little larger. The gills are long, cylindrical, coiled inwards, or straight, with a short conical dorsal cirrus. The anterior setae are barred, the posterior ones nearly smooth.

Remarks: These Indian specimens differ slightly from the *N. malmgreni* from Europe, for the dorsal posterior lamella does not appear to be bilobed.

Length: 70—80 mm.

Colour: Yellowish-white, in spirits.

Occurrence: Andaman Sea, 279 fms. Off Akyab, Burma, 250 fms.

Distribution: Indian Ocean, Andaman Sea, Bay of Bengal; Atlantic Ocean, North Sea, Mediterranean Sea.

214. Nephthys polybranchia Southern. (Fig. 115, *a—c*)

Nephthys polybranchia, Southern, 1921, p. 607, pl. XXIV, fig. 11: Fauvel, 1932, p. 118.

Prostomium with four tentacles on the anterior border; two small eyes. Ventral cirrus of the first foot very small, the dorsal is quite rudimentary. Setigerous lobes bluntly conical. Dorsal lamellae shorter than the setigerous lobe, ventral lamellae a little longer, both rami

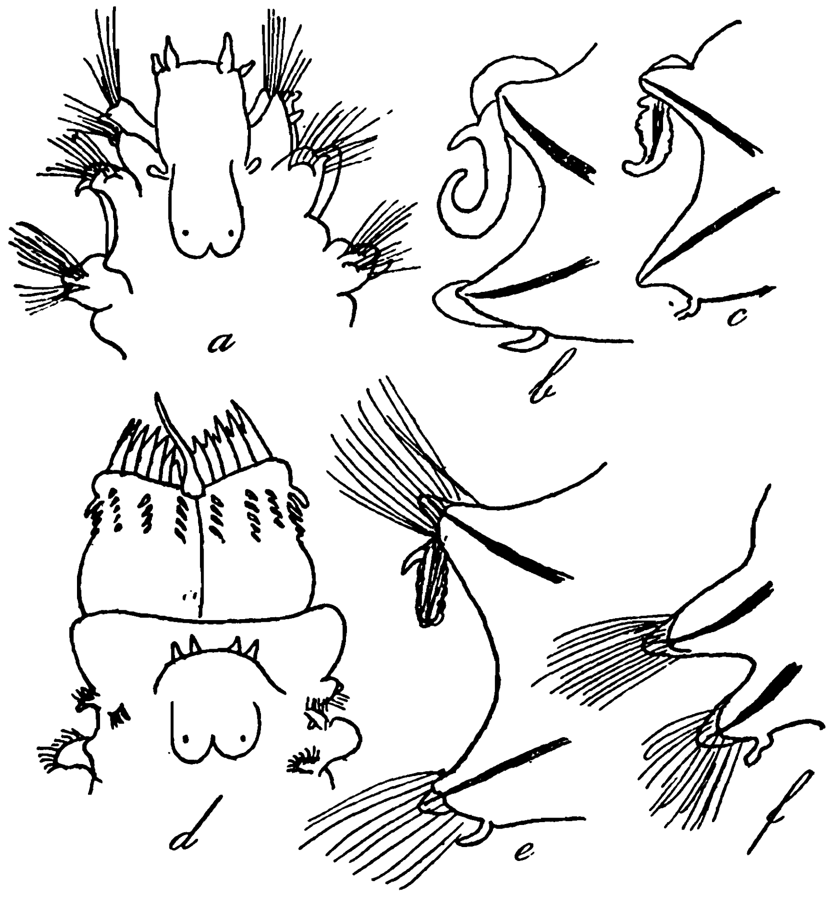


Fig. 115.—*Nephthys polybranchia* Southern: *a,* anterior end ×46 (after Southern); *b,* 13th foot ×50; *c,* hind foot ×50. *N. oligobranchia* Southern: *d,* anterior end and proboscis ×30 (after Southern); *e,* 14th foot ×50; *f,* hind foot ×50.

widely apart, but not very divergent. A small gill on the second foot, well developed ones from the seventh to the 30th segment, where they become short, broad, foliaceous, with a median ridge, and the dorsal cirrus is reduced to a small knob. They persist to the end of the body. The camerated or barred setae are restricted to the anterior feet and are replaced in the middle and posterior feet by long, slender, capillary setae with slightly flattened blades,

very finely serrated along one edge. The condition of the gills appears to be somewhat variable.

Length: About 20 mm. A brackish-water form.

Occurrence: Shanghai; Taleh-Sap; Calcutta Water Works (Pulta); Chilka Lake, Madras.

215. **Nephthys oligobranchia** Southern. (Fig. 115, *d--f*)

Nephthys oligobranchia, Southern, 1921, p. 610, pl. XXIV, fig. 12: Fauvel, 1932, p. 119.

" Differs from *N. polybranchia* in the distribution of the branchiae which occur fully developed on the sixth foot, and disappear on the 20th to the 23rd foot, whereas in *N. polybranchia* the branchiae are larger on the fifth foot and persist almost to the end of the body; in that the branchiae contain a double vascular loop whereas there is only a single loop in *N. polybranchia;* in that the posterior lamellae of the feet are considerably surpassed by the spiral lobe." (Southern)

Remarks: As there are also several vascular loops in, at least, the anterior branchiae of *N. polybranchia*, differences on that account are not of much value. Both may be only varieties of one species. Both live in water of variable salinity. The number and disposition of the papillae of the proboscis have not the value generally set on them for the identification of *Nephthys* for there is often a wide range of variation.

Length: 10—20 mm.

Occurrence: Calcutta Water Works (Pulta) and Salt Lakes; Chilka Lake; Vizagapatam; Cochin backwater.

Distribution: Taleh-Sap; Kiangsee; Mergui; Bay of Bengal; India.

Incertae Sedis—

216. **Nephthys dussumieri** Valenciennes, Quatrefages, 1865, p. 427. From the coast of Malabar.

Family EUNICIDAE Grube.

Body elongate, vermiform. Prostomium with lobate palps more or less united. Tentacles subulate, 1 to 7 or more. First two segments generally achaetous and apodous. Sometimes one pair of tentacular cirri on the second segment. Feet uniramous or sesquiramous. Dorsal cirri with or without branchiae, sometimes rudimentary or missing. Ventral cirrus sometimes missing. Setae

simple, or simple and compound, very varied in shape. Proboscis armed with lower jaw-plates (labrum) and a number of biserial toothed upper jaw-plates. Sometimes a membranous tube.

The *Eunicidae* are divided into subfamilies and genera as follows:

Key to the subfamilies and Genera of EUNICIDAE.

1. Prostomium without (visible) tentacles and palps. Dorsal cirri rudimentary; no ventral cirri	Subfamily *LUMBRICONERINAE* Grube, 14.
Prostomium with tentacles	2
2. No ventral cirri. Dorsal cirri foliaceous. Three tentacles ..	*LYSARETINAE* Kinberg, 12.
Ventral cirri present. Dorsal cirri foliaceous	3
3. Two tentacles and two cylindrical palps. Upper jaw composed of from 2 to 4 longitudinal series of very small and numerous pieces	*STAUROCEPHALINAE* Kinberg, 11.
From 1 to 7 tentacles. Palps short, globular. Upper jaw consisting of 4—5 pairs of pieces ..	4
4. Seven tentacles, 5 occipitals, mounted on ringed ceratophores and 2 frontals ovate ..	*ONUPHIDINAE* Levinsen, 8.
From 1 to 5 occipital tentacles, ovate frontals absent ..	*EUNICINAE* Kinberg, 5.
5. Branchiae present. 5 tentacles	6
Branchiae absent ..	7
6. Tentacular cirri present ..	*Eunice* Cuvier, p. 231.
Tentacular cirri absent ..	*Marphysa* Quatrefages, p. 224.
7. Three tentacles. Tentacular cirri absent	*Lysidice* Savigny, p. 248.
One tentacle. Tentacular cirri absent	*Nematonereis* Schmarda, p. 249.
8. Tentacular cirri absent	*Hyalinoecia* Malmgren, p. 260.
Tentacular cirri present	9
9. Branchial filaments inserted spirally	*Diopatra* Aud. & M.-Edwards, p. 251.
Branchiae cirriform or pectinate	10
10. Three anterior feet much enlarged, directed forwards and bearing long capillary bristles	*Rhamphobrachium* Ehlers, p. 261.

Anterior feet little modified, bearing hooked bristles, simple or compound	*Onuphis*, Aud. & M.-Edwards, p. 253.
11. Tentacles and palps very large, more or less articulate. Dorsal and ventral cirri well developed ..	*Staurocephalus* Grube, p. 278.
Tentacles and palps rudimentary. Dorsal and ventral cirri very short ..	*Ophryotrocha* Clap. & Mecznikow.
12. Three short tentacles. Branchiae absent	13
Tentacles rudimentary or absent. Branchiae present ..	*Iphitime* Marenzeller.
13. Three subulate tentacles folded backwards into a dorsal groove	*Halla* Costs.
Three short rounded tentacles partly hidden under the border of the first segment	*Aglaurides* Ehlers, p. 250.
14. Small parasitic worms	18
Free, and often very large worms	15
15. Cirriform branchiae present	*Ninoë* Kinberg, p. 277.
Branchiae absent	16
16. Capillary setae and hooks simple or compound	*Lumbriconereis* Blainville (Grube rev.), p. 263.
Only winged capillary setae	17
17. With a stout acicular bristle. Jaws III and IV single hooks	*Drilonereis* Claparède, p. 276.
Dorsal acicular bristle absent. Jaws III and IV toothed plates. Four eyes ..	*Arabella* Grube, p. 274.
18. Lower jaw well developed, with 2 hooks. Parasitic on Syllids	*Labrorostratus* Saint-Joseph.
Lower jaw reduced, without hooks. Parasitic on *Spio* and *Bonellia*	*Oligognathus* Spengel.

The genera *Iphitime, Halla, Labrorostratus, Oligognathus* and *Ophryotrocha* are not yet recorded from India.

The genus *Nicidion* which differs only from *Eunice* in the absence of gills may be regarded as a subgenus of the latter, if not as simple varieties. Other genera, such as *Paramarphysa, Paradiopatra, Paraonuphis,* are doubtful and further investigations are still wanted to settle their status.

Subfamily *EUNICINAE* Kinberg.

Two palps. One, two or five occipital tentacles. Frontal tentacles absent. Anterior feet not modified. Bran-

chiae pectinate or simple, or missing. Setae simple, compound and acicular. A lower jaw and 3–5 pairs of upper jaws.

Genus EUNICE Cuvier.

Leodice Savigny.

Eriphyle Kinberg.

Body very long. Head with five tentacles; cirrophore not ringed; two bulbous palps. A pair of tentacular cirri inserted on the second apodous segment. Dorsal cirri elongate; ventral cirri short or knob-like. Branchiae simple, or more generally pinnate. Parapodia sesquiramous, with acicular setae, simple pectinate (or comb-like) and compound setae. Lower jaw of two pieces. Upper jaws with a pair of mandibles and two or three pairs of toothed plates, an unpaired left plate and sometimes paragnaths.

Key to the species of Eunice.

1. Gills simple, or with only two filaments; beginning very far from the head	2
Gills branched	4
2. Comb and acicular setae absent	*siciliensis* Grube, p. 241.
Comb and acicular setae present	3
3. Gills begin about 28th foot	*marenzelleri* Gravier, p. 242.
Gills begin about 80th–100th foot	*gracilis* Crossland, p. 243.
4. Gills bipectinate	*investigatoris* Fauvel, p. 239.
Gills pectinate	5
5. Acicular setae tridentate	6
Acicular setae bidentate	8
6. Gills well developed in the posterior part of the body	*antennata* Savigny, p. 240.
Gills absent in the posterior part of the body	7
7. Gills begin on 3rd or 5th foot. Tentacles smooth	*indica* Kinberg, p. 241.
Gills begin about 6th–7th foot. Tentacles annulate	*australis* Quatrefages, p. 240.
8. Forming tubes of characteristic structure ..	9
Without special tubes ..	10
9. Compound setae with sword-shaped terminal piece anteriorly, sickle-shaped posteriorly	*tubifex* Crossland, p. 232.
Compound setae all sickle-shaped	*floridana* Pourtales, p. 235.

10. Gills occur only on the anterior third of the body, beginning about 6th to 9th foot	*coccinea* Grube, p. 236.
Gills continue nearly to the hind end of the body	11
11. Gills begin about 3rd to 8th foot	13
Gills begin about 10th to 30th foot and attain to from 4 to 16 filaments anteriorly but are simpler in the posterior region	12
12. Gills begin about 10th to 20th foot and attain to from 6 to 16 filaments	*afra* Peters, p. 235.
Gills begin about 25th to 30th foot and attain to from 4 to 6 filaments ..	*afra* var. *paupera* Grube, p. 236.
13. Very large species. Tentacles smooth. Gills up to 25—30 and more filaments ..	*aphroditois* Pallas, p. 233.
Smaller species. Tentacles annulated	14
14. Gills begin about 4th to 6th foot and consist of 6—20 filaments	*tentaculata* Quatrefages, p. 234.
Gills begin on 3rd or 4th foot and consist of 2 to 4 filaments	15
15. Gills suddenly disappear about 80th segment ..	*savignyi* Grube, p. 238.
Gills continue nearly to the last segments	*grubei* Gravier, p. 237.

217 **Eunice tubifex** Crossland. (Fig. 116, *a—g*).

Eunice tubifex, Crossland, 1904, p. 303, figs. 52—55, pl. XXI, figs. 1—8: Willey, 1905, p. 282: Fauvel, 1930, p. 26.

Prostomium bilobed. Tentacles short, smooth. Gills begin about 20th—35th foot and attain 3—6 filaments. Body with very large, thick, ventral glandular pads for about 50 segments, then rounded and decreasing. In the anterior feet, the compound setae have a smooth elongate *knife-like* end-piece. In the middle and posterior regions the end-pieces are bidentate, *sickle-shaped* hooks as in other species. A membranaceous tube.

Length: 150—220 mm. by 5—10 mm.

Colour: in spirit, dark mahogany, more or less checkered.

Occurrence: Ceylon, Gulf of Mannar, Krusadai Island.

Distribution: South Australia; Philippine Islands; Indian Ocean; Atlantic Ocean.

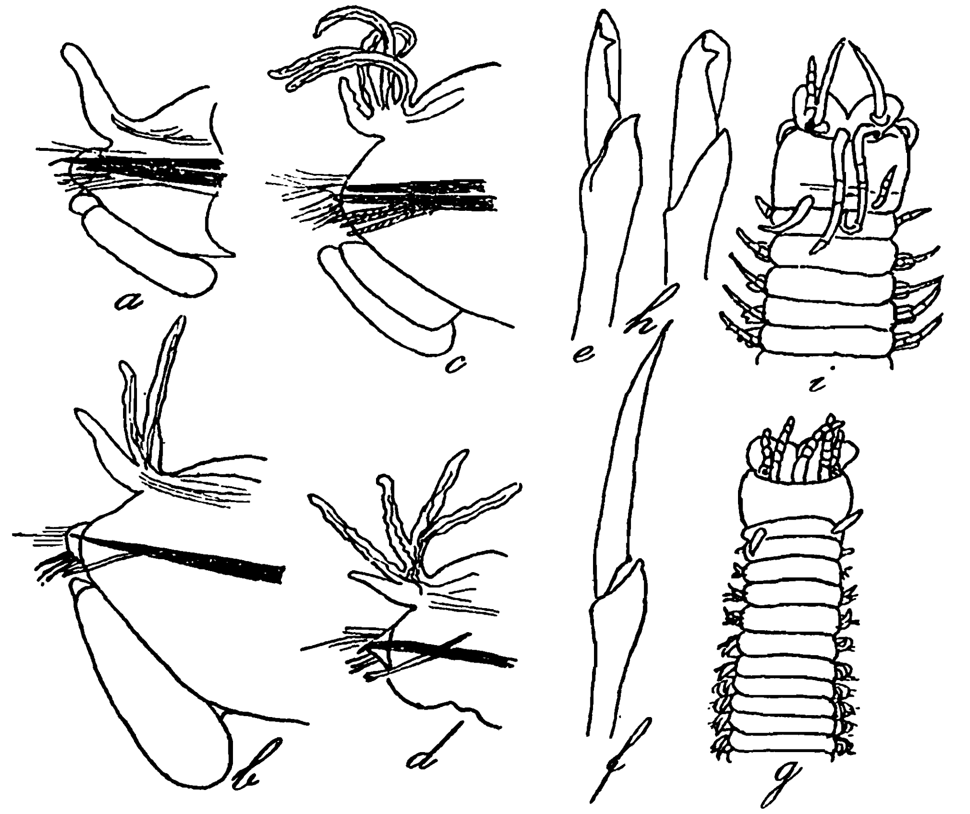


Fig. 116.—*Eunice tubifex* Crossland: *a*, 20th foot ×16; *b*, 80th foot ×16; *c*, 120th foot ×16; *d*, hind foot ×16; *e*, falciger; *f*, knife-ended compound seta from 20th foot; *g*, anterior part (after Crossland). *E. afra* Peters: *h*, falciger ×245; *i*, head (after Crossland).

218. Eunice aphroditois Pallas. (Fig. 117, *a–g*).

Eunice aphroditois, Fauvel, 1917, p. 215, pl. VII (Synonymy); 1930b, p. 533; 1932, p. 133: Pruvot, 1930, p. 65: Monro, 1931, p. 44; Augener, 1926, p. 455.

Eunice roussaei, Quatrefages, 1865, p. 309, pl. X, figs. 1—4: Fauvel, 1917, p. 220, pl. VIII (Synonymy).

Eunice gigantea, Quatrefages, 1865, p. 311.

A very large species. Palps bilobed or multi-lobed. Tentacles short, blunt, smooth or faintly wrinkled. Tentacular cirri short. The gills, which begin about the 5th to 10th foot, are generally branched on the 5th–6th foot and attain up to 25, 30, and even 40 filaments. Acicular bristles black, blunt, missing in old specimens or irregularly distributed in the posterior region. Acicular, black, compound bristles with short sickle-shaped endpiece.

Length: Up to 1 metre, and more, by 20—25 mm.

Colour: In spirit, a brown chequered pattern, often with a white collar on third and fourth setigerous segments. The colour fades in alcohol. Dark blue in life, patapodial lobes tipped with white, yellowish brown spots (when young)

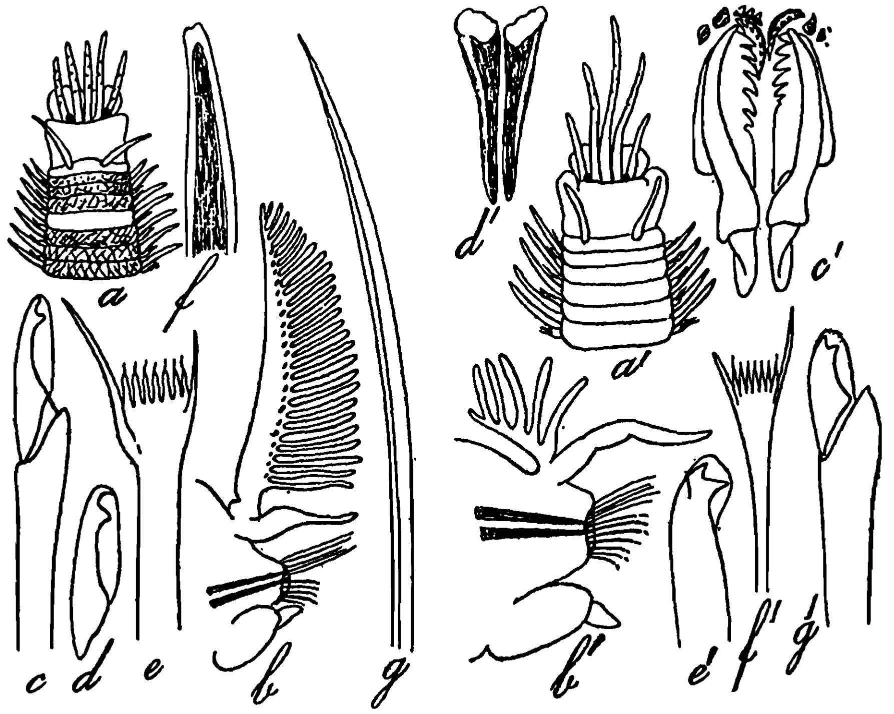


Fig. 117.—*Eunice aphroditois* (Pallas): *a*, anterior part, reduced; *b*, 32nd foot ×2; *c*, *d*, falcigers ×70; *e*, comb-seta ×175; *f*, acicular bristle ×105; *g*, simple bristle ×105. *E. floridana* Pourtales, *a'*, anterior part ×1½; *b'*, 31st foot ×8; *c'*, superior jaws; *d'*, labium (lower jaw); *e'*, acicular bristle ×85; *f'*, comb-seta ×210; *g'*, falciger ×105.

Occurrence: Singapore, Andaman Islands, Gangetic Delta, Ceylon, Maldive Archipelago.

Distribution: Pacific, Indian and Atlantic Oceans; Mediterranean Sea.

219. Eunice tentaculata Quatrefages. (Fig. 118, *m—p*).

Eunice tentaculata, Quatrefages, 1865, p. 317: Fauvel, 1917, p. 209, fig. XVII (Synonymy); 1930, p. 25; 1932, p. 134.

Eunice pycnobranchiata, McIntosh, 1885, p. 294, pl. XXIV, figs. 13—15.

Eunice elseyi, Baird, 1870b, p. 344.

Eunice martensi, Willey, 1905, p. 281, pl. IV, figs. 102—104.

Palps more or less bilobed. Tentacles annulated, rather long. Tentacular cirri articulate. Gills begin about 3rd to 6th foot and attain to 6—20 filaments and conti-

nue to the hind part of the body. Acicula and acicular setae black.

Length: 200—350 mm. by 10—15 mm.

Colour: Purple-violet in life. Brown or spotted in spirit, sometimes a white collar on the fourth setiger.

Occurrence: Ceylon, Galle, Gulf of Mannar, Laccadive Islands.

Distribution: New Zealand; Australia; Malaya Seas; Nicobar Islands; Andaman Islands; India; Laccadive Islands.

220. **Eunice floridana** Pourtales. (Fig. 117, *a'—g'*)

Eunice floridana, Ehlers, 1887, p. 88, pl. XXII, fig. 17: Fauvel, 1923, p. 402, 1914b, p. 149, pl. I, figs. 5, 8, 11; 1912, p. 134.
Eunice gunneri, Roule, 1907, p. 33, pl. II, fig. 11.
Eunice amphiheliae, Roule, 1896, p. 446.
Eunice philocorallia, Buchanan, 1893, p. 173, pl. IX, figs. 2—6; pl. X, figs. 7—9; pl. XI.

Palps bilobed. Tentacles articulate or moniliform, the median twice as long as the laterals. Tentacular cirri smooth. Gills begin about 7th to 10th foot and attain to 8—10 filaments, and continue nearly to the last segments. Acicula and acicular setae black. Commensal with corals. A membranaceous tube.

Length: 100—200 mm.

Colour: Black, pink, or brown, with mahogany spots. Sometimes a pale collar on the fourth setigerous segment.

Occurrence: Laccadive Sea.

Distribution: Indian and Atlantic Oceans, Mediterranean Sea.

221. **Eunice afra** Peters. (Fig. 116, *h—i*)

Eunice afra, Crossland, 1904, p. 289, pl. XX, fig. 15: Willey, 1905, p. 279: Augener, 1926, p. 456: Fauvel, 1930b, p. 25; 1932, p. 135: Pruvot, 1930, p. 69.

Tentacles smooth or faintly annulate. Gills begin about 13th to 20th foot and attain to 4—16 filaments, and continue to the hind part of the body. Acicula and acicular setae dark. Body nearly cylindrical anteriorly, broad and flattened posteriorly.

Length: 150—250 mm.

Colour: Dark coloured, more or less spotted with white dots, sometimes a clear collar on the fourth setigerous segment.

Occurrence: Mergui; Gulf of Mannar; Ceylon.

Distribution: Pacific Ocean, Philippine Islands, Malaya Seas; Indian Ocean, Zanzibar, Madagascar, Red Sea.

var. **paupera** Grube.

Eunice paupera, Grube, 1878, p. 160: Pruvot, 1930, p. 69; Fauvel, 1930b, p. 537: 1932, p. 135.

Palps slightly bilobed, tentacles smooth or faintly wrinkled; the median reaches backwards to the fourth setigerous segment. Tentacular cirri smooth, subulate, somewhat shorter than the buccal segment. Gills begin about 23rd–27th foot. First 2, 3 or 9 gills are simple; succeeding ones are bifid or trifid and the following ones decrease to two, or even one, filament. Gills are missing on the last tenth of the body, or more. Acicula and acicular setae black. The section of the body is semi-cylindrical, and flattened in the hind part.

Remarks: This is a variety of *E. afra,* differing only in its simpler gills (reduced to 3–4 filaments) beginning farther from the head. There is a whole range of intermediate forms.

Length: 200–250 mm.

Colour: Colourless in spirit.

Occurrence: India.

Distribution: New Caledonia; Philippine Islands; Malay Seas; Red Sea.

222. **Eunice coccinea** Grube. (Fig. 118, *a–e*)

Eunice coccinea, Grube, 1878, p. 153, pl. IX, fig. 1: Crossland, 1904, p. 297, pl. XX, figs. 6–7: Willey, 1905, p. 280: Ehlers, 1908, p. 85: Fauvel, 1919, p. 375, fig. 5; 1932, p. 136.

Tentacles smooth. Gills begin about 6th, 9th, to 13th foot; they attain to 6–20 filaments and occur only on the anterior third of the body, which is highly arched dorsally throughout its length. Acicular setae bidentate or blunt. Hind body rounded.

Length: 100–130 mm.

Colour: red or red violet, in spirit, with small white dots. A pale collar on the fourth setigerous segment.

Remarks: Differs chiefly from *E. afra* by the posterior part of the body being rounded instead of flattened, and gills more numerous and with more filaments.

Occurrence: Ceylon; Maldive Archipelago.

Distribution: Philippine Islands; Malayas Seas; Indian Ocean, Red Sea; Atlantic Ocean, Gulf of Guinea.

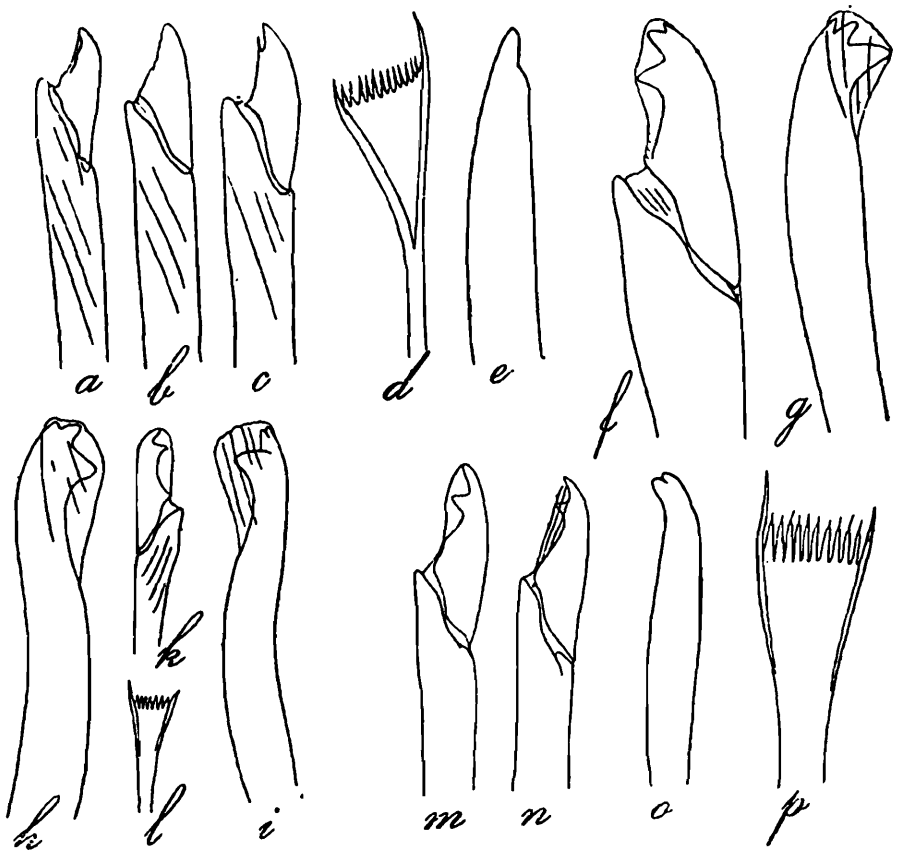


Fig. 118.—*Eunice coccinea* Grube: *a, b, c,* more or less worn out falcigers ×245; *d,* comb-seta ×230; *e,* acicular bristle ×230. *E. antennata* Savigny, *f,* hind foot's falciger ×230; *g,* acicular bristle ×105. *E. australis* Quatrefages: *h, i,* acicular bristles ×105; *k,* falciger ×105; *l,* comb-seta ×105. *E. tentaculata* Quatrefages: *m, n,* falcigers ×105; *o,* acicular bristle ×105; *p,* comb-seta ×230.

223. Eunice grubei Gravier. (Fig. 119, *a—e*)

Eunice grubei, Gravier, 1900, p. 258, pl. XIV, figs. 87—88: Crossland, 1904, p. 288: Pruvot, 1930, p. 68 (Synonymy): Fauvel, 1932, p. 136; 1939, p. 334.

(?) *Eunice micropion*, Marenzeller, 1879, p. 135, pl. V, fig. 1: Monro, 1924, p. 55.

Tentacles articulate. Gills begin on 3rd—4th foot; they attain to 4—10 filaments and continue nearly to the last segments. Acicula dark or yellow. Acicular setae bidentate.

Length: 150—230 mm. by 7 mm.

Colour: In spirit, uniformly dark grey-brown, iridescent.

Occurrence: Singapore; Camorta Island, Nicobars; Off Akyab, Burma.

Distribution: Japan (?), New Caledonia, Amboina, Indo-China, Philippine Islands, Malayas Seas; Nicobar Islands, Maldive Archipelago, Red Sea, East Africa.

224. **Eunice savignyi** Grube. (Fig. 119, *h–k*)

Eunice savignyi, Grube, 1878, p. 150: Ehlers, 1908, p. 88, pl. IX, figs. 7–13: Fauvel, 1932, p. 136.

Tentacles articulate. Gills begin on 3rd or 4th foot; they attain to 8–15 filaments, but further back become reduced to one and finally disappear altogether about

Fig. 119.—*Eunice grubei* Gravier: *a*, comb-setae; *b*, falciger; *c*, acicular bristle; *d*, anterior foot; *e*, 37th foot (after Gravier). *E. marenzelleri* Gravier: *f*, foot. *E. indica* Kinberg: *g*, falciger ×333. *E. savignyi* Grube: *h*, 25th foot ×23 (after Ehlers). *i*, falciger ×333; *k*, acicular bristle ×133.

30th–40th feet. Acicular setae yellow, bidentate. The edge of the labrum is prominent, white and toothed.

Length: 60–70 mm. by 3–4 mm.

Colour: Brown-yellow, iridescent.

Occurrence: Ceylon; Persian Gulf.

Distribution: Philippine Islands; Ceylon, Persian Gulf, Agulhas Current.

225. Eunice investigatoris Fauvel. (Fig. 120, *a–f*)

Eunice investigatoris, Fauvel, 1932, p. 137, fig. 19.

Body cylindrical anteriorly, semi-cylindrical in the middle and flattened in the hind part. Palps bilobed. The three median tentacles are subequal and reach backwards to the 6th–7th setigerous segment; the two outer tentacles are hardly as long. The tentacles are all subulate, slender and smooth. The buccal segment (peristomium) is thrice as long as the succeeding one. Two tentacular cirri set on a short achaetous segment. Gills from the 6th setigerous segment, the first one small, but already compound; they are very large about the 7th–8th, with 18–20 filaments about the 14th setiger. Well developed

Fig. 120.—*Eunice investigatoris* Fauvel: *a,* 5th foot ×23; *b,* 10th foot ×23; *c,* fragment of branched gill ×23; *d,* comb-seta ×295; *e,* compound seta ×117; *f,* acicular bristle ×117.

on about forty segments, they decrease in size in the mid-body and increase again very much in the posterior region, where they continue to the 6th–7th small segments preceding the pygidium. *The posterior gills are dichotomously branched.* In the mid-body there are already a few bifid or trifid filaments. Dorsal cirri long and smooth in the first segments, then shorter than the gills: they are not knife-like, and, except the first ones, hardly thicker than the branchial filaments. Ventral cirri finger-like in the first 5–6 feet, in the succeeding ones short and moniliform; they again become digitiform in the posterior

half of the body, becoming longer and longer toward the hind part, where they are twice as long as the feet. Pygidium with two long, smooth, ventral cirri. Acicula black. Acicular setae black, bidentate, hooded, beginning about the 44th—45th foot. Comb-setae long, narrow, with 8—10 teeth and equal sides, or, sometimes, one longer. Capillary setae long, slender, faintly winged. Terminal pieces of the compound setae strongly bidentate, with a hood not protruding above the tip, the shaft is slightly enlarged. Labrum dark, with anterior edge toothed. A single specimen, 110 mm. long and 7 mm. broad, colourless or light yellowish-grey in spirit.

Occurrence: Persian Gulf, 25 fms. " Investigator ".

226. **Eunice antennata** Savigny. (Fig. 118, *f—g*)

Eunice antennata, Crossland, 1904, p. 312, pl. XXII, figs. 1—7; Willey, 1905, p. 280: Augener, 1926, p. 456: Gravely, 1927, p. 17: Fauvel, 1917, p. 225, fig. XX; 1932, p. 138; 1939, p. 334; Pruvot, 1930, p. 72.

Tentacles *deeply annulated.* Gills beginning about the 4th—6th foot, continued to near the anus; they attain to 10—15 filaments and are *much more developed in the anterior and posterior regions than in the mid-body.* Acicular setae yellow, *tridentate.*

Length: 100—160 mm. by 5—8 mm.

Occurrence: Singapore; Andaman Islands; Gulf of Mannar, Ceylon; Persian Gulf.

Distribution: Pacific Ocean, Philippines, Indo-China; India, Persian Gulf, Red Sea.

227. **Eunice australis** Quatrefages. (Fig. 118, *h—l*)

Eunice australis, Fauvel, 1917, p. 228 (Synonymy), Fig. XXI: Augener, 1926, p. 437.
Eunice murrayi McIntosh, Crossland, 1904, p. 310: Willey, 1905, p. 281.

Tentacles deeply annulated. Gills beginning about 6th—7th foot; they attain to 10—15 filaments. They are found *only on the anterior third of the body* and disappear suddenly. Acicular bristles yellow, *tridentate.*

Length: 60—90 mm. by 5 mm.

Colour: In spirit, yellowish, with sometimes a white spot on the back of each segment.

Occurrence: Nankauri, Nicobar Islands, Andaman Islands; Off Cape Negrais, Burma; Ceylon.

Distribution: Australia; New-Zealand; India, Maldive Archipelago, Gulf of Oman, Zanzibar, Cape of Good Hope.

228. **Eunice indica** Kinberg. (Fig. 119, *g*).

Eunice indica, Crossland, 1904, p. 318, pl. XXI, figs. 9–12: Willey, 1905, p. 280: Fauvel, 1919, p. 378 (Synonymy); 1932, p. 139: Monro, 1937, p. 296.

Tentacles smooth. Gills begin on 3rd foot; they attain to 10–20 filaments and are found only on the anterior third of the body. Acicular setae yellow, numerous (4–5), *tridentate*. Terminal piece of the compound setae sometimes tridentate *with a sharp protruding guard*. Closely allied to the European *E. vittata* D. Ch.

Length: 50–70 mm.

Colour: Yellowish, discoloured in spirit.

Occurrence: Nankauri, Nicobar Islands; Mergui; Bay of Bengal; Ceylon; Maldive Archipelago; Gulf of Oman.

Distribution: Japan, New Caledonia, Gambier Islands; Indian Ocean, Persian Gulf, Red Sea.

229. **Eunice siciliensis** Grube. (Fig. 121, *e–m*)

Eunice siciliensis, Fauvel, 1923a, p. 405, fig. 159, *e–m;* 1917, p. 231 (Synonymy); 1932, p. 138; Crossland, 1904, p. 323, pl. XXII, figs. 8–9: Willey, 1905, p. 282: Augener, 1926, p. 457: Gravely, 1927, p. 17.

Eunice leucodon, Ehlers, 1901, p. 128, pl. XVI, figs. 1–10.

Body divided into two distinct regions, an anterior narrow and rounded, and a posterior soft and flattened. Tentacles short, smooth or faintly annulate. *Gills simple,* beginning very far from the head, about 60th, 70th, or 100th foot. *Comb-setae and acicular setae absent.* Lower jaw (labrum) white, calcareous, gouge-like.

Length: 150–300 mm.

Colour: Anterior part pink or brown; middle body slate-blue or dark green. In mature specimens, posterior part long, swollen, soft, with a brownish-red spot in the middle of the ventral part of each segment, as in the Palolo worm. In the short uncoloured posterior part, preceding the pygidium, this brown spot fades gradually or disappears altogether in different specimens. The sexual region very likely breaks off when mature and is regenerated later, as is the case of the Palolo worm, which is also an inhabitant of corals.

Occurrence: Nankauri, Nicobar Islands; Andaman Islands; Gulf of Mannar; Ceylon; Maldive Archipelago; Muskat Shore, Gulf of Oman; Persian Gulf.

Distribution: Cosmopolitan; Pacific, Indian and Atlantic Oceans, Mediterranean Sea.

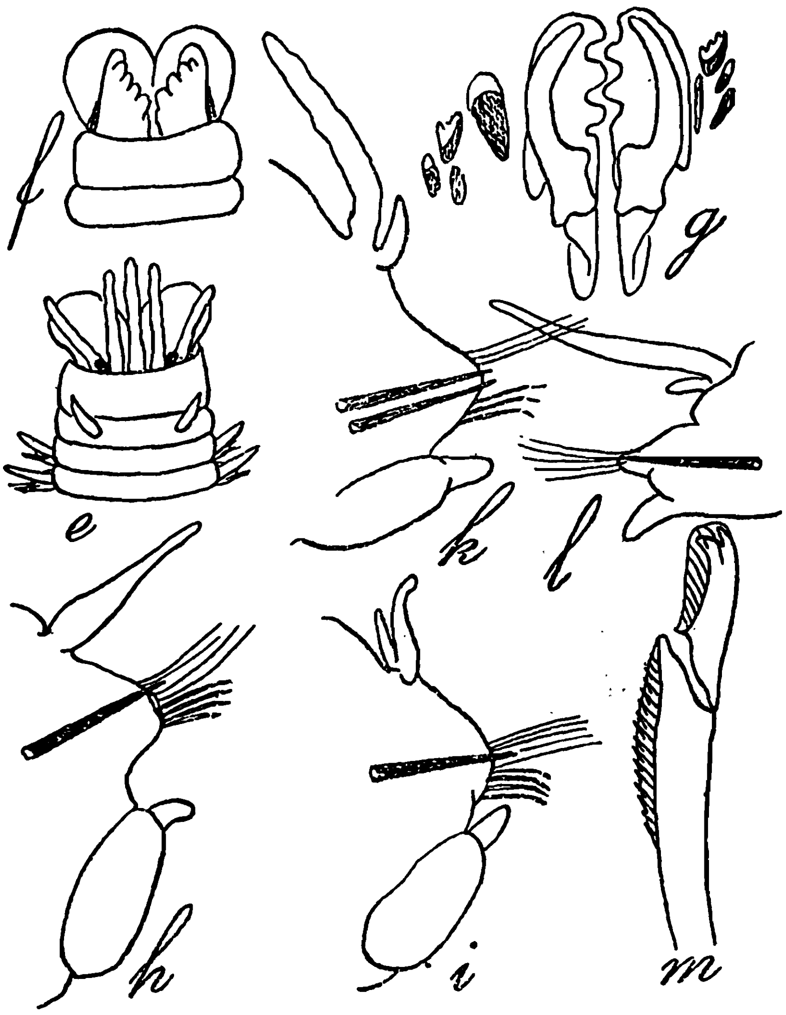


Fig. 121.—*Eunice siciliensis* Grube: *e, f*, head, dorsal and ventral view; *g*, upper jaws; *h*, anterior foot ×15; *i*, one of the first branchiate feet ×15; *k*, foot from mid-body ×15; *l*, hind foot ×15; *m*, falciger ×400.

230. **Eunice marenzelleri** Gravier. (Fig. 119, *f*).

Eunice marenzelleri, Gravier, 1901, p. 229, figs. 78–82, pl. XIII, figs. 68, 69: Fauvel, 1919, p. 378.

Palps bilobed. Tentacles smooth, short and slender. Tentacular cirri smooth. Gills begin about the 28th foot; *they are all simple*, very long and persist to the hind part of the body. The dorsal cirri decrease from before backwards. Acicula and acicular setae brown. Simple setae, *compound setae, and comb setae* present.

Length: 140 mm. by 5 mm.

Colour: Uniform red-brown.

Remarks: The presence of acicular and comb-setae clearly differentiates this species from *E. siciliensis* Grube.

Occurrence: Persian Gulf.

Distribution: Red Sea; Persian Gulf.

231. **Eunice (Nicidion) gracilis** Crossland. (Fig. 122, *a–f*)

Eunice gracilis, Fauvel, 1930a, p. 26, fig. 6; 1932, p. 140, fig. 20.
Nicidion gracilis, Crossland, 1904, p. 327, figs. 65–66; pl. XXII, figs. 10, 11: Augener, 1913, p. 284.

Body small, filiform, rounded. Tentacles short, smooth or very faintly annulate. Gills beginning very far from the head, about 80th–100th foot or even farther back. They are simple, or consist of two flaments. Comb-setae and acicular setae present. Prostomium broad, slightly notched in front. Eyes large, reniform.

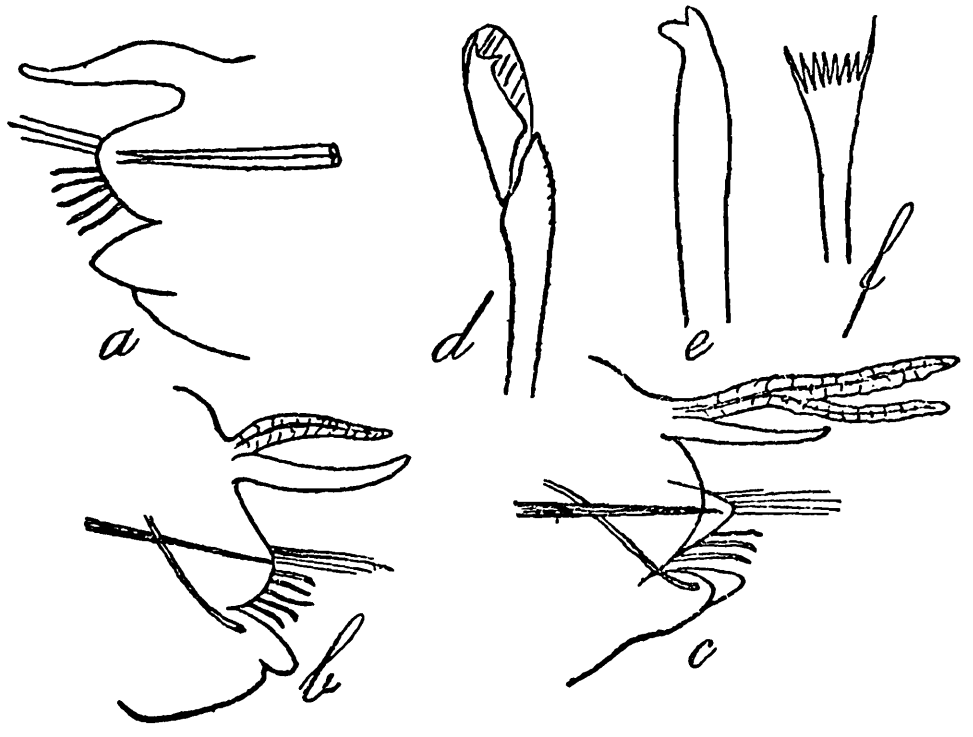


Fig. 122.—*Eunice* (*Nicidion*) *gracilis* Crossland: *a*, anterior abranchiate foot ×45; *b*, foot, with simple gill ×45; *c*, foot with bifid gill ×45; *d*, posterior falciger ×380; *e*, acicular bristle ×380; *f*, comb-seta ×380.

Length: 20–60 mm.

Remarks: The gills commence very far back from the head, at first small and simple, occurring very irregularly, except in the posterior region, where they consist of two filaments, and are longer than the dorsal cirrus; they are missing on incomplete specimens and on the young. Such was the case in Crossland's and Augener's specimens. The genus *Nicidion* differs only from *Eunice* in wanting gills: but already in several so-called *Nicidion*, which

proved to be only varieties or anomalies of *Eunice* species, gills were found in adult specimens, very far from the head. Thus *Nicidion gracilis* is, perhaps, a young specimen, or a variety, of *E. marenzelleri* Grube, as *N. edentulum* is a variety of *E. siciliensis* Grube.

Occurrence: Mergui; Gulf of Mannar.

Distribution: Australia, Indo-China; Indian Ocean, Mergui, Gulf of Mannar, Zanzibar.

Genus MARPHYSA Quatrefages.

Prostomium rounded or trilobed. Two bulbous palps. Five tentacles. Two eyes. *Tentacular cirri absent.* Dorsal cirri elongated, ventral cirri short. Gills simple or pectinate. Dorsal setae simple, capillary; ventral setae simple or compound, with knife-like, or sickle-shaped, terminal pieces. Comb-setae. Acicular setae. Lower jaw (labrum) of two pieces. Upper jaw with a pair of mandibles, two pairs of toothed plates, an unpaired plate and sometimes paragnaths.

Key to the species of Marphysa.

1. Compound setae of two kinds, knife-like and sickle-shaped ..	*fallax* Mar. & Bobretzky, p. 247.
Ventral setae all of ore kind	2
2. Gills only on a short anterior part of the body ..	*stragulum* (Grube), p. 247.
Gills on the greater part of the body	3
3. Ventral setae simple	*mossambica* Peters, p. 246.
Ventral setae compound	4
4. Terminal piece of the compound setae sickle-shaped	*corallina* Kinberg.
Terminal piece of the compound setae knife-like	5
5. Prostomium horse-shoe shaped	*macintoshi* Crossland, p. 246.
Prostomium bilobed ..	6
6. Compound setae present on the anterior and posterior parts of the body ..	*sanguinea* Montagu, p. 245.
Compound setae absent in the anterior and posterior parts of the body ..	*gravelyi* Southern, p. 246.

Marphysa corallina Kinberg, recorded from Madagascar, Red Sea, Cape of Good Hope and Pacific Ocean, has not yet been found in the area of the Indian fauna.

232. Marphysa sanguinea Montagu. (Fig. 123, *a–h*)

Marphysa sanguinea, Fauvel, 1923a, p. 408, fig. 161, (Synonymy); 1932, p. 141.

Marphysa furcellata, Crossland, 1903, p. 141, pl. XV, figs. 13–14: Gravely, 1927, p. 18.

Prostomium bilobed. Tentacles short. Gills, which begin about 16th–30th foot, attain up to 4–7 filaments, and continue to the hind part of the body. Dorsal setae capillary, ventral setae compound, with long knife-like

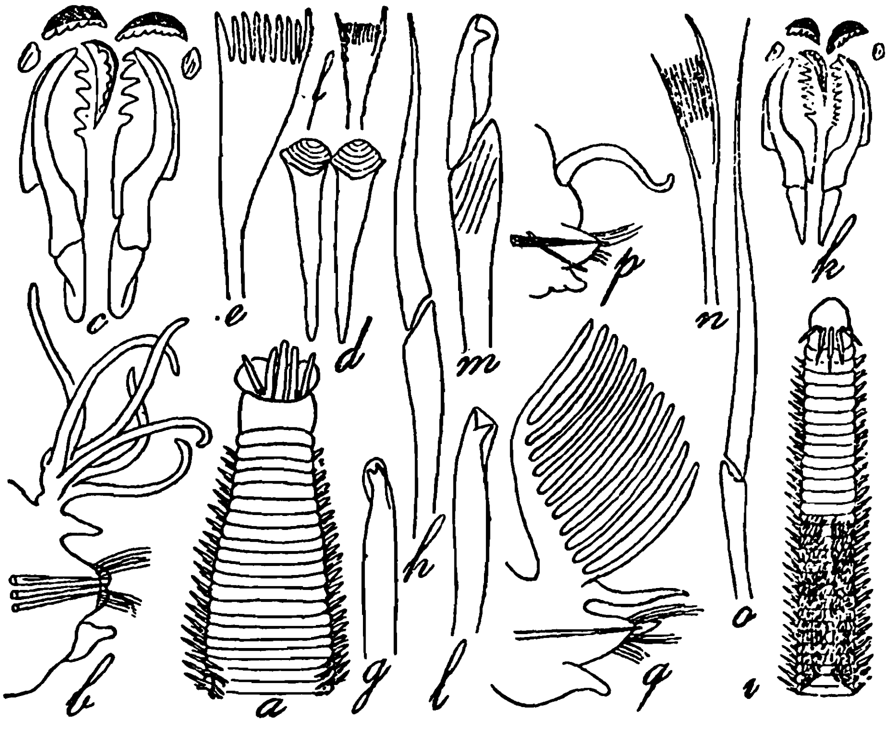


Fig. 123.—*Marphysa sanguinea* Montagu: *a*, anterior part, natural size; *b*, foot from mid-body ×12; *c*, upper jaws; *d*, lower jaw; *e*, *f*, two kinds of comb-setae ×80; *g*, acicular bristle ×90; *h*, knife-ended compound bristle ×195; *M. bellii* Aud. & M.-Edw. (a species hardly distinct from *M. stragulum* (Grube); *i*, anterior part ×5; *k*, upper jaws; *l*, acicular bristle ×120; *m*, falciger ×400; *n*, comb-seta ×100; *o*, cultriform seta ×250; *p*, foot from mid-body ×25; *q*, branchiate foot ×25.

terminal piece. Comb-setae very variable; in the posterior segment they are shorter, with a few large teeth. Acicular setae irregularly present in the posterior part of the body, sometimes almost entirely missing.

Length: Up to 300–600 mm.

Colour: In life pink-gray, iridescent, bright red gills. Very brittle. Posterior part often regenerated.

Occurrence: Vizagapatam, Pondichery, Gulf of Mannar, Pamban, Tuticorin, Travancore, Mormugao Bay, Goa.

Distribution: Australia, New Caledonia; Indian Ocean, Red Sea; Atlantic Ocean, Mediterranean Sea.

233. Marphysa macintoshi Crossland.

Marphysa macintoshi, Crossland, 1903, p. 137, pl. XIV, fig. 3—6: Fauvel, 1930, p. 28.

Body long, slender, nearly cylindrical. Prostomium broad, undivided, horse-shoe shaped. Setae and branchiae as in *M. sanguinea* Montagu.

Length: 200—300 mm. by 4 mm.

Colour: No regular pigmentation.

Occurrence: Krusadai Island.

Distribution: Indian Ocean, India, Red Sea, Zanzibar.

234. Marphysa gravelyi Southern.

Marphysa gravelyi, Southern, 1921, p. 617, pl. XXIV, fig. 13: Gravely, 1927, p. 19: Fauvel, 1932, p. 142.

Prostomium bilobed. Tentacles subequal, a little longer than the prostomium. The gills, which begin about 36th—52nd foot, and attain up to 8—9 filaments continue to the hind part of the body. Dorsal setae simple, capillary. In the posterior segments the ventral compound setae, with knife-like terminal piece, are gradually replaced by capillary setae. Bifid acicular bristles. Body flattened.

Length: Up to 240—270 mm. by 5 mm.

Occurrence: Chilka Lake, Adyar, Madras (in brackish water)

235. Marphysa mossambica Peters.

Marphysa mossambica, Fauvel, 1919, p. 380 (Synonymy); 1932, p. 142: Crossland, 1903, p. 139, pl. XV, figs. 7—10: Gravely, 1927, p. 19: Monro, 1931, p. 45.

Nauphanta novae-hollandiae, Kinberg, 1857—1910, p. 43, pl. XVI, fig. 23.

Prostomium bilobed. Tentacles longer than the head. The gills which begin about 30th—33rd foot, attain to 7—8 filaments, and continue to the hind part of the body. *Dorsal and ventral setae simple. Compound setae missing altogether.*

Length: Up to 280 mm.

Occurrence: Singapore; Nicobar Islands, Nankauri, in Coral Reefs; Pondichery; Kilakarai; Gulf of Mannar.

Distribution: Philippine Islands; Australia; Bay of Bengal, India, Red Sea, East Africa.

236. **Marphysa stragulum** (Grube) (Fig. 123, *i—q*).

Eunice stragulum, Grube, 1878, p. 163.
Marphysa stragulum, Crossland, 1903, p. 136.

Body slender, elongated. Prostomium broad, rounded, undivided. Tentacles slightly longer than the head. The gills, which begin about the 12th—13th foot, are very large, with numerous filaments, covering the back entirely, but present only on 12—20 segments. Dorsal setae simple, capillary. Ventral setae compound, with a long knife-like terminal piece. In the posterior feet falcigerous setae. Acicular setae pale, unidentate.

Length: 20—90 mm. by 2—4 mm.

Occurrence: Ceylon; Cochin State Coast.

Distribution: Philippine Islands; Ceylon.

Note—This species is hardly distinct from *M. bellii* Aud. Edw.

237 **Marphysa fallax** Marion and Bobretzky. (Fig. 124, *o—v*)

Marphysa fallax, Fauvel, 1923a, p. 410, fig. 162, *o—v*.
Marphysa chevalensis, Willey, 1905, p. 282.

Body long and slender. Prostomium rounded, bilobed. Branchiae, with 1—3 filaments, from about 10th—14th foot, absent on the 15—20 last ones. Upper setae simple; inferior ones of two kinds: (1) compound falcigerous with bidenate end-piece, (2) compound with knife-like end-piece. Comb setae. Acicula yellow. Acicular setae bidentate.

Length: 15—40 mm.

Colour: Back red, with white dots, second segment pale (In life). Mimics a *Lysidice*.

Occurrence: Cheval Paar, Gulf of Mannar.

Distribution: Gulf of Mannar; Atlantic Ocean, Mediterranean Sea, Alexandria, Adriatic Sea, English Channel.

Genus PARAMARPHYSA Ehlers.

Differs from *Marphysa* in the absence of branchiae.

238. **Paramarphysa orientalis** Willey.

Paramarphysa orientalis, Willey, 1905, p. 283, pl. IV, fig. 105: Fauvel, 1939, p. 336, Okuda, 1937, p. 287, figs. 42—33.

Prostomium bilobed. Tentacles short. Two eyes. *Gills absent.* Acicula and acicular bidentate setae dark. Upper setae simple, capillary. Comb-setae with long marginal laciniae. Compound setae all with falcigerous bidentate end-piece.

Length: 10–28 mm. by 1 mm. 90–104 setigerous segments.

Occurrence: Cheval Paar, Gulf of Mannar.

Distribution: Pacific Ocean; Palan Islands, Indo-China, Gulf of Siam, Poulo Condore; Ceylon.

Genus LYSIDICE Savigny.

Three tentacles. Tentacular cirri absent. Dorsal and ventral cirri. Branchiae absent. Setae: simple capillary; comb-like, compound falcigerous and acicular setae. Lower jaw (labrum) of two pieces. Upper jaw with a pair of mandibles, two toothed plates, an unpaired plate and paragnaths.

239. **Lysidice collaris** Grube. (Fig. 124, *a–g*)

Lysidice collaris, Marenzeller, 1879, p. 28, pl. V, fig. 2: Fauvel, 1917, p. 236 (Synonymy); 1932, p. 143: Gravely, 1927, p. 19: Monro, 1931, p. 45: Willey, 1905, p. 284.

Lysidice sulcata, Treadwell, 1902, p. 200, fig. 47.

(?) *Lysidice fallax*, Ehlers, 1898, p. 15.

Eyes reniform or semilunar. *Lysidice fallax* Ehlers, often met with, like the "Palolo" worm, in swarms, is probably the epitocous condition of *L. collaris*, with large eyes, provided with a lens.

Length: 50–150 mm.

Colour: Preserved specimens are generally more or less completely colourless or light brown. Sometimes there are still traces of the white ring near the anterior end.

Occurrence: Singapore; Andaman Islands; Kilakarai; Pamban; Ceylon; Maldive Archipelago.

Distribution: Japan, Gambier Islands, New Caledonia, Philippine Islands, Australia, Gulf of Siam; Indian Ocean, Persian Gulf, Red Sea.

Note.—Differs from *L. ninetta* Aud. and M.-Edwards only by the shape of its eyes, reniform instead of rounded.

Genus NEMATONEREIS Schmarda.

Body filiform. A single tentacle; no palps. 2—4 eyes. No tentacular cirri. Dorsal and ventral cirri present. Branchiae absent. Simple capillary setae, comb-setae, falcigerous compound setae, acicular setae. Lower jaw of two pieces. Upper jaw with a pair of mandibles, two pairs of jaws, an unpaired plate.

240. Nematonereis unicornis Grube. (Fig. 124, *h—n*).

Nematonereis unicornis, Fauvel, 1923a, p. 412, fig. 162, h—n; 1927, p. 28: Willey, 1905, p. 284.

Prostomium rounded anteriorly. Two large posterior eyes, with, sometimes, a smaller anterior pair. An occipital spindle-shaped tentacle. Dorsal cirri subulate. Ventral cirri pyriform. Acicula dark. Acicular setae bidentate, dark. Compound setae falcigerous, bidentate. Comb-setae. Upper setae simple, capillary, limbate.

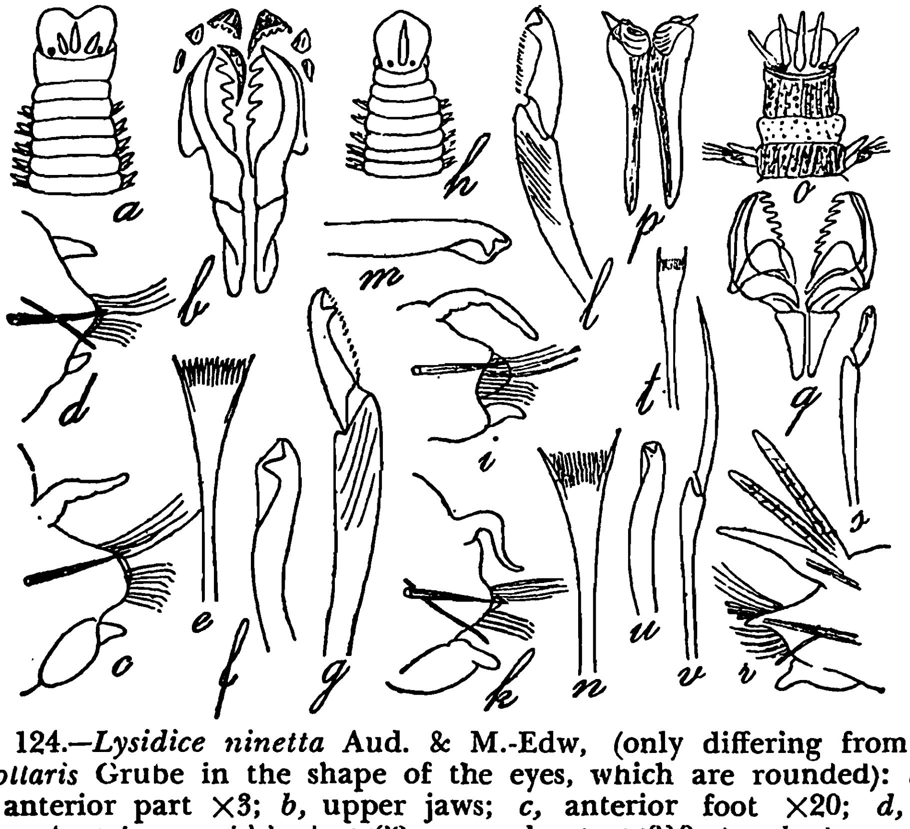


Fig. 124.—*Lysidice ninetta* Aud. & M.-Edw, (only differing from *L. collaris* Grube in the shape of the eyes, which are rounded): *a*, anterior part ×3; *b*, upper jaws; *c*, anterior foot ×20; *d*, foot from mid-body ×20; *e*, comb-seta ×310; *f*, acicular bristle ×235; *g*, falciger ×310. *Nematonereis unicornis* Grube: *h*. anterior part ×5; *i*, anterior foot ×120; *k*, foot from mid-body ×120; *l*, falciger ×350; *m*, acicular bristle ×300; *n*, comb-seta ×350; *Marphysa fallax* Mar. & Bobr: *o*, anterior part; *p*, lower jaw; *q*, upper jaws; *r*, foot from mid-body; *s*, bidentate falciger; *t*, comb-seta; *u*, acicular bristle; *v*, cultriform compound bristle.

Length: 150–200 mm. by 1 mm.

Colour: Pink, iridescent, anteriorly orange, posteriorly greenish.

Occurrence: Gulf of Mannar; Pamban; Krusadai; Cheval Paar.

Distribution: Malay Archipelago, Indo-China; Indian Ocean, India, Suez Canal; Atlantic Ocean; Mediterranean Sea.

Sub-family *LYSARETINAE* Kinberg.

No palps. Three tentacles. Very large flattened dorsal cirri. Branchiae absent. All setae simple. Four anal cirri. Mandibles toothed. Jaws more or less symmetrical.

Genus AGLAURIDES Ehlers.

Syn. *Aglaura* and *Oenone* Savigny.

Prostomium rounded. Eyes present. Palps absent. Three short tentacles more or less hidden under the anterior border of the peristomium. Nuchal organs protrusible. Parapodia sesquiramous. Dorsal cirri large, thick, flattened. Setigerous lobe with two unequal ligules. Setae simple, capillary. Acicular setae. Lower jaw of two pieces. Upper jaw with five pairs of symmetrical or asymmetrical toothed plates and two long supports.

241. **Aglaurides fulgida** Savigny. (Fig. 125, *a–f*).

Aglaurides fulgida, Willey, 1905, p. 284, pl. V, fig. 107: Michaelsen, 1892, p. 9: Fauvel, 1917, p. 240, pl. VI, figs. 52–55 (Synonymy); 1930a, p. 31; 1932, p. 151.

Aglaurides erythraeensis, Gravier, 1900, p. 278, pl. XIV, figs. 99–103: Fauvel, 1914d, p. 131, pl. VII, figs. 1–4.

Aglaurides symmetrica, Fauvel, 1919, p. 388.

Oenone fulgida, Augener, 1913, p. 290: Crossland, 1924, p. 85, figs. 106–111.

Prostomium rounded. Two pairs of eyes, anterior large, posterior small. Tentacles very short, rounded. Peristomium biannulate on the sides, with longitudinal ventral folds. Dorsal cirri chopper-shaped. Anterior ligule short, rounded; posterior ligule more elongated. Acicular setae yellow, bidentate, hooded. Upper jaw plates very variable in shape. One pair of mandibles and four pairs of toothed plates.

Length: 100–250 mm. by 5–10 mm.

Colour: Orange above, light yellow at sides and below.

Occurrence: Singapore; Mergui Archipelago, Paway Island; Nicobar Islands, Nankauri; Kilakarai; Pedro Shoal; Ceylon, Colombo; Maldive Archipelago.

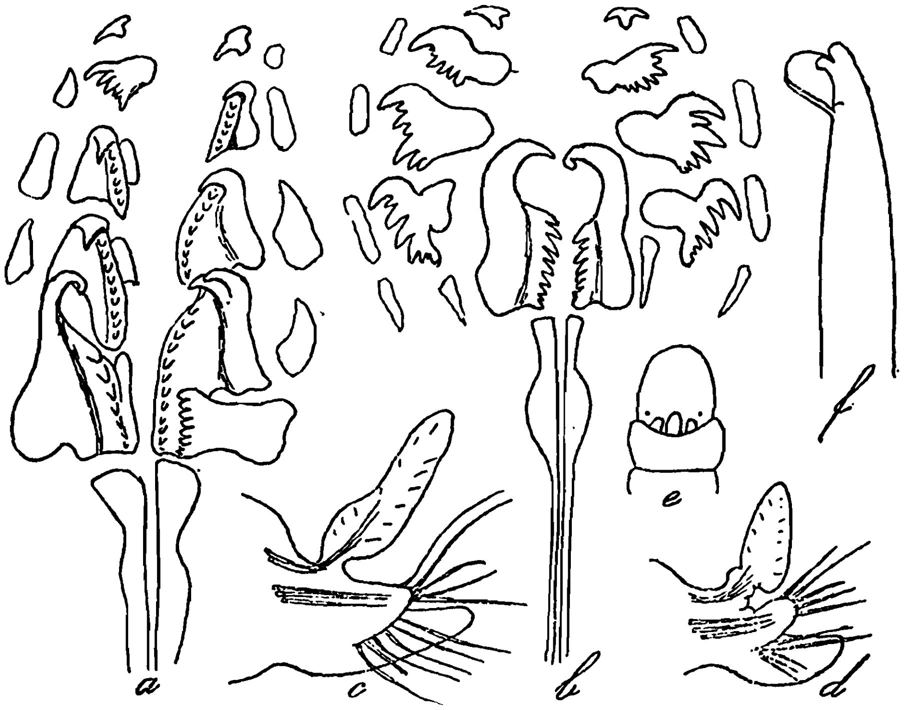


Fig. 125.—*Aglaurides fulgida* (Savigny): *a*, var. *asymmetrica;* upper jaws, dorsal view of the plates ×16; *b*, var. *symmetrica*, upper jaws, plates flattened ×16; *c*, 70th foot ×25; *d*, 13th foot ×25; *e*, head; *f*, acicular bristle ×134.

Distribution: Polynesia, Australia, Philippine Islands, Indo-China; Nicobar Islands, Ceylon, India, Maldive Archipelago, Persian Gulf, Red Sea; Atlantic Ocean, Gulf of Guinea, West Indies, Florida.

Sub-family *ONUPHIDINAE* Levinsen.

Two globular palps; two frontal tentacles (frontal palps); five occipital tentacles. Anterior feet more or less modified. Gills simple, or pectinate, or spiral. Capillary setae; compound or pseudo-compound setae only on the first setigerous segment; comb-setae. Four anal cirri. A labrum; upper jaws 3—5 pairs with an odd plate.

Genus DIOPATRA Audouin and Milne-Edwards.

Head rounded. Two pad-like palps. Two small oval frontal tentacles. Five long occipital tentacles borne on long ringed ceratophores. An achaetous segment bearing two small tentacular cirri. Dorsal cirri subulate.

Ventral cirri subulate in a few anterior feet, the following ones pad-like. Pseudo-compound bristles in the anterior feet, succeeded by simple setae, comb-setae and acicular setae. Gills large, with a number of filaments inserted spirally. Lower jaw (labrum) of two pieces. Upper jaw with a pair of mandibles, three pairs of toothed plates and an unpaired one. Tube membranaceous, sticking in the sand or mud.

242. **Diopatra neapolitana** Delle Chiaje. (Fig. 126, *a—h*)

Diopatra neapolitana, Fauvel, 1923a, p. 419, fig. 166, *a—h* (Synonymy); 1930, p. 29; 1932, p. 144; 1933, p. 28: Crossland, 1903, p. 132, pl. XIV, fig. 1.
Diopatra amboinensis, Willey, 1905, p. 274, pl. IV, figs. 95—97.
Diopatra variabilis, Southern, 1921, p. 611, pl. XXV, fig. 14.
(?) *Diopatra phyllocirra,* Schmarda, 1861, p. 133, pl. XXXII, fig. 261.

Body large and very long, rounded anteriorly, depressed and brittle in the posterior region. Palps small, glo-

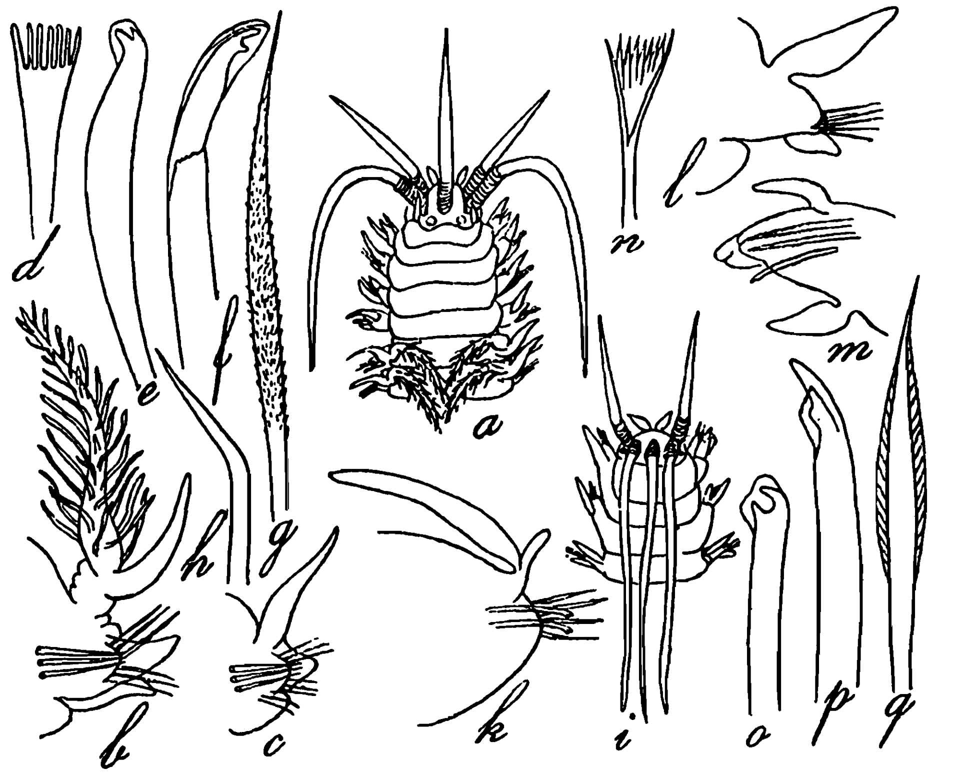


Fig. 126.—*Diopatra neapolitana* Delle Chiaje: *a,* anterior part ×2½ *b,* 10th foot with gills ×8; *c,* foot from mid-body ×8; *d,* comb-seta ×120; *e,* acicular bristle ×120; *f,* hook from 3rd setigerous segment ×120; *g,* spinulose capillary bristle ×80; *h,* kneed aciculum ×45. *Hyalinoecia tubicola* (O. F. Müller); *i,* anterior part (after McIntosh); *k,* foot from mid-body ×80; *l,* 12th foot ×80; *m,* first setigerous segment ×45; *n,* comb-seta ×310; *o,* acicular bristle ×310; *p,* hook from first foot ×195; *q,* winged capillary bristle ×195.

bular. Ringed ceratophore of tentacles much shorter than the palpostyle. Two anterior tentacles shorter than the three posterior ones, which are subequal. Eyes absent. Gills begin on 4th or 5th foot. They are very large, covering the back, but decrease in size and disappear about the 50th—70th foot. On the first 4—5 setigerous segments, simple winged setae and pseudo-compound bristles, ending in a bidentate hook with a sharp pointed hood. In the succeeding feet, simple setae with two wings and comb-setae with numerous fine teeth, or a few large teeth. Hooded acicular setae bidentate. A number of yellow, tapering, geniculate acicula. Membranous tube partly buried in sand, the upper part thick, tough, more or less coated with debris.

Length: 150—500 mm.

Colour: Body pale yellow, iridescent; back and feet with white dots. Branchiae with green spiral streaks. In spirit, yellowish with brown spots.

Occurrence: Burma, Mergui; Gangetic Delta; Orissa Coast; Madras Coast; Ceylon; Gulf of Mannar; Maldive Archipelago.

Distribution: Pacific Ocean, China Sea, Gulf of Siam; Indian Ocean, Arabian Sea, Gulf of Oman, Persian Gulf, Red Sea; Atlantic Ocean, Mediterranean Sea.

Genus ONUPHIS Audouin and Milne-Edwards.

Head rounded. Eyes present or absent. Two pad-like palps. Two small fusiform frontal tentacles. Five occipital tentacles borne on long ringed ceratophores. An achaetous segment bearing two small tentacular cirri. Dorsal cirri subulate; ventral cirri subulate in the anterior feet, pad-like in the succeeding region. Pseudo-compound bristles in the anterior feet, succeeded by simple setae, comb-setae and acicular setae. Gills simple or pectinate. Lower jaw (labrum) of two pieces. Upper jaw with a pair of mandibles, 2—3 pairs of toothed plates and an unpaired plate. Tube membranaceous, sometimes free.

Key to the species of Onuphis.

1. Gills simple 2
   Gills not simple 3
2. Gills begin on the first foot .. *holobranchiata* Marenzeller, p. 256.

Gills begin about 11th—13th foot ..	*conchylega* Sars, p. 255.
3. Gills bifid ..	*dibranchiata* Willey, p. 254.
Gills pectinate	4
4. Furcate pseudo-compound bristles	*furcatosetosa* Monro, p. 254.
No furcate bristles	5
5. Gills begin at the 1st or 2nd foot ..	6
Gills begin on the 5th—6th foot	*investigatoris* Fauvel, p. 258.
6. Gills begin on the first foot and remain simple on the next 10—20 feet, then pectinate	*eremita* Aud. & M.-Edw. p. 257.
Gills begin on 2nd foot and are pectinate on the 4th	*aucklandensis* Augener, p. 257.

243. Onuphis dibranchiata Willey.

Onuphis dibranchiata, Willey, 1905, p. 277, pl. IV, fig. 100: Gravely, 1927, p. 20, pl. IX, fig. 7.

Gills begin as a simple filament on the first foot and continue simple on the first 17 parapodia, thereafter becoming bifid and considerably longer than the dorsal cirri. First dorsal cirrus tumid at the base, rather shorter than the first filament. Pseudo-compound bristles with bi- or tri-dentate terminal piece in the first 3—5 feet. Tentacles with long ringed ceratophores. Tube covered with coarse sand grains.

Width: 3 mm.

Occurrence: Lagoon, Krusadai Island.

244. Onuphis furcatosetosa Monro. (Fig. 127, *a—b*).

Onuphis furcatosetosa, Monro, 1937, p. 290, fig. 15.

The gills have a *woolly appearance*. They begin on the first foot with two minute filaments and rapidly increase to 18 about the 15th foot and remain *highly ramified*. The first 3 setigers have flattened capillary bristles and the place of the usual compound hooks is taken by curious simple, or incipiently pseudo-compound, bristles having a very slight and scarcely noticeable notch, marking the place where the usual articulation is found, and very long hoods the ends of which are prolonged into two tapering points which form a *terminal fork*. Inside the hood an ill defined bidentate hook can be seen. Tubes formed of mud.

Length: 35 mm. by 3 mm.

Colour: A brown streak on the head and brown transverse segmental bands in the anterior region.

Occurrence: Gulf of Oman; Gulf of Aden; Red Sea, at depths of 186–375 m.

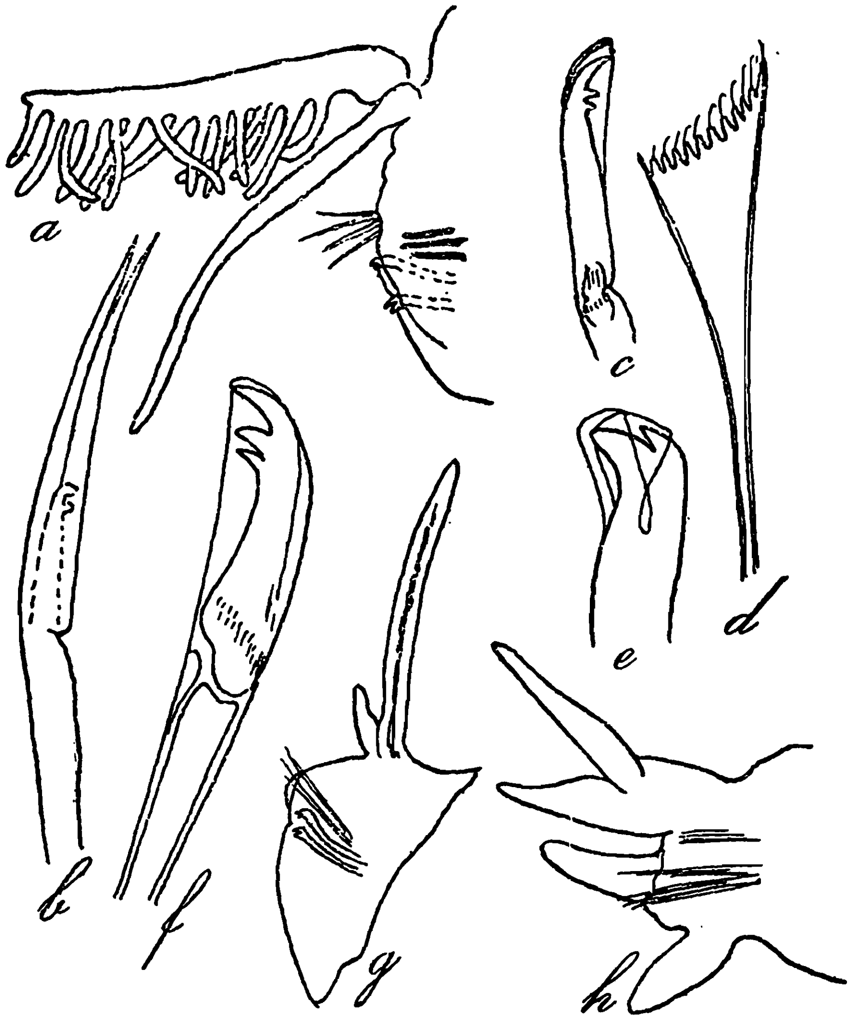


Fig. 127.—*Onuphis furcatosetosa* Monro: *a*, 12th foot; *b*, forked bristle (after Monro). *O. aucklandensis* Augener; *c*, hook from first foot ×225; *d*, comb-seta ×350; *e*, acicular bristle from mid-body ×225 (after Augener). *O. holobranchiata* Marenzeller: *f*, compound hook from 3rd foot ×260; *g*, 33rd foot ×28; *h*, first foot (after Marenzeller).

245. Onuphis conchylega Sars. (Fig. 128, *a—m*).

Onuphis conchylega Sars, Fauvel, 1923a, p. 145, fig. 164, (Synonymy); 1932, p. 145: Willey, 1905, p. 276.

All the branchiae are simple and begin about 11th—13th foot. First and second feet larger and pointing forwards with a few stout, blunt, simple hooks, replaced in the third foot by pseudo-articulate, uni- or bi-dentate bristles. Tube membranaceous, *flattened,* coated with mud and shells.

Length: 100—150 mm.

Colour: Variable, body anteriorly with transverse brown stripes.

Occurrence: Andaman Sea; Gulf of Mannar; Ceylon.

Distribution: Indian Ocean; Atlantic Ocean, Mediterranean.

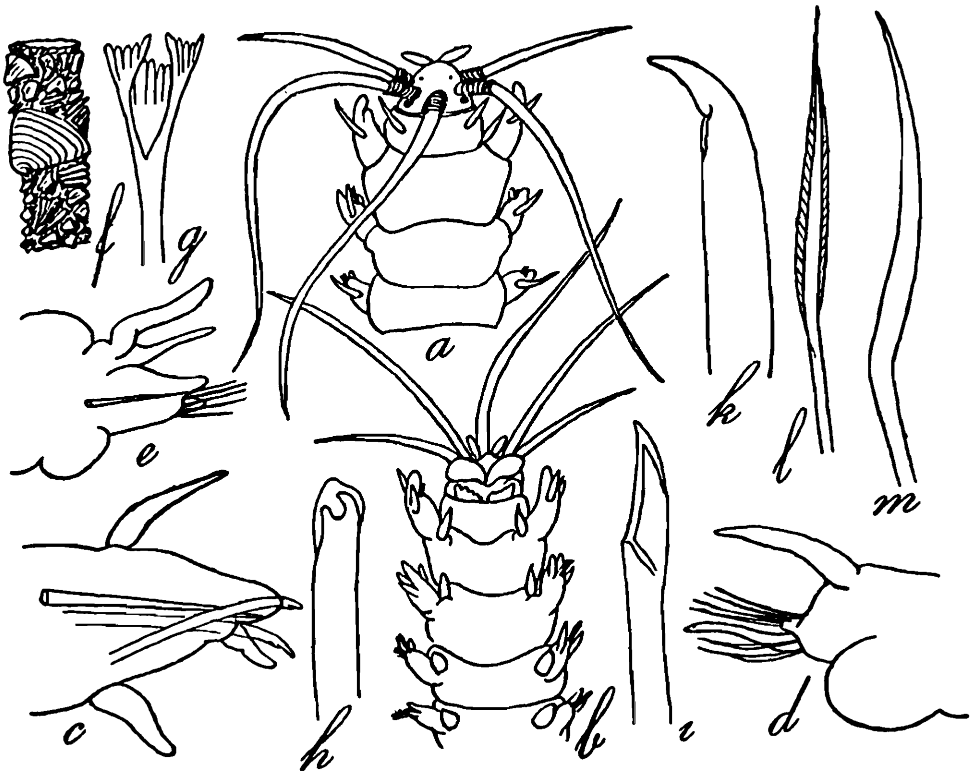


Fig. 128.—*Onuphis conchylega* Sars: *a, b,* anterior part, dorsal and ventral view ×3; *c,* first foot ×23; *d,* 8th foot ×23; *e,* 20th foot ×23; *f,* tube, reduced; *g,* comb-seta ×310; *h,* acicular bristle ×117; *i,* pseudo-compound bristle ×117; *k,* hook from 2nd foot ×78; *l,* winged capillary ×78; *m,* capillary bristle ×78.

246. Onuphis holobranchiata Marenzeller. (Fig. 127, *f—h*).

Onuphis holobranchiata, Marenzeller, 1879, p. 132, pl. IV, fig. 1: Willey, 1905, p. 278, pl. IV, fig. 101: Angener, 1913, p. 283: Crossland, 1903, p. 155, pl. XVI, fig. 2: Fauvel, 1930a, p. 30; 1932, p. 146.

Gills all simple, beginning on the first foot. Eyes more or less conspicuous. Pseudo-compound bristles on the first four feet, with bi-dentate or tri-dentate terminal piece.

Length: 40 mm.

Colour: Transverse pigment streaks on the anterior segments.

Occurrence: Nankauri, Nicobar Islands; Gulf of Mannar.

Distribution: Japan; Nicobar Islands, Gulf of Mannar, Maldive Archipelago.

247 **Onuphis aucklandensis** Augener. (Fig. 127, *c–e*)

Onuphis aucklandensis, Augener, 1924, p. 418, fig. 11: Fauvel. 1932, p. 146.

Onuphis tenuisetis, Benham (*non* McIntosh), 1909, p. 5.

Gills begin on the second foot, and are pectinate on the 3rd–4th feet, and attain to 6–7 filaments. Tentacles long, reaching to 24th–27th segment, with short ringed ceratophore. Bi- or tri-dentate pseudo-compound hooks in the first 3 feet. Eyes absent.

Length: 8–120 mm. by 6–7 mm.

Occurrence: Andaman Islands; Off Puri, Orissa.

Distribution: New Zealand; Andaman Islands, India.

248. **Onuphis eremita** Audouin and Milne-Edwards. (Fig. 129, *a–l*).

Onuphis eremita, Fauvel, 1923a, p. 414, fig. 163 (Synonymy); 1932, p. 146.

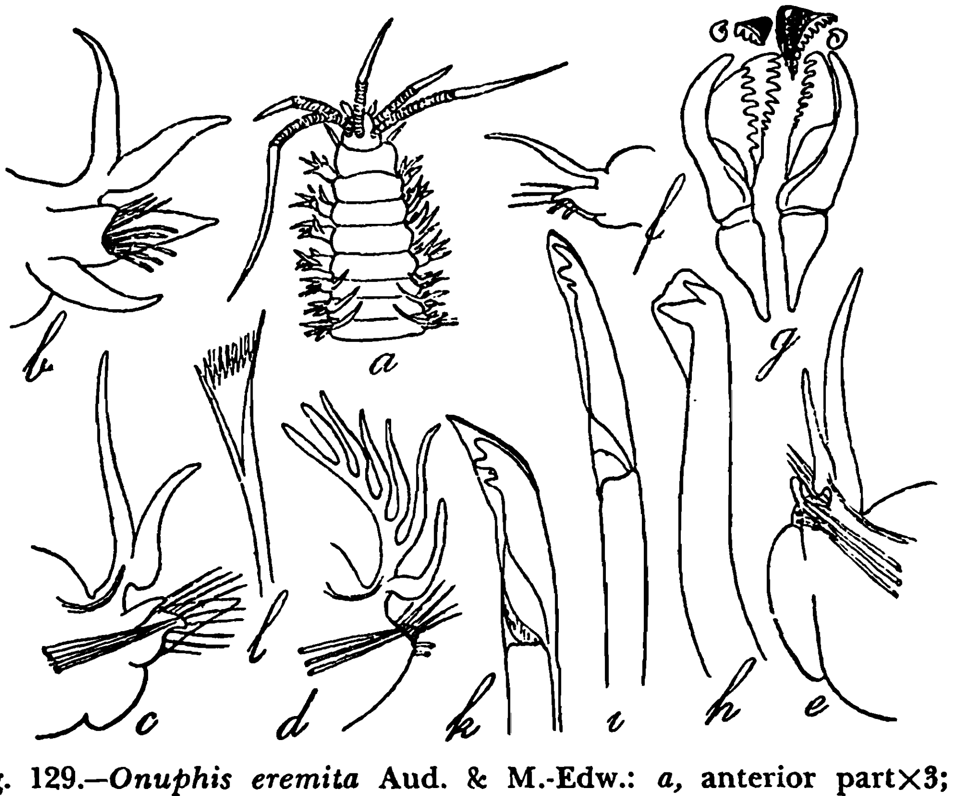


Fig. 129.—*Onuphis eremita* Aud. & M.-Edw.: *a*, anterior part×3; *b*, first foot ×12; *c*, 7th foot ×12; *d*, foot from mid-body ×12; *e*, 16th foot ×12; *f*, hind foot ×12; *g*, upper jaws; *h*, acicular bristle ×117; *i*, compound hook from 5th foot ×117; *k*, compound hook from 2nd foot ×117; *l*, comb-seta ×310.

Onuphis basipicta, Willey, 1905, p. 275, pl. IV, figs. 98, 99: Augener, 1926, p. 457.

Onuphis landanaensis, Augener, 1918, p. 339, pl. V, figs. 135—138, pl. VI, fig. 197.

Gills begin on the first foot, simple on the 10—22 succeeding feet, pectinate in the succeeding region, and attain 5—6 filaments. Pseudo-compound bristles with bi- or tri-dentate terminal piece, in the first 3—5 feet. Tentacles with long, ringed ceratophores. Eyes absent.

Length: 80—120 mm.

Colour: Back violet, ventral side white. In spirit, yellowish-grey, iridescent, with brown spots.

Occurrence: Akyab, Burma; Mergui Archipelago; Madras; Ceylon, Galle and Trincomali.

Distribution: Indo-China; Bay of Bengal, India; Madagascar; Suez Canal; Atlantic Ocean, Mediterranean Sea.

249. **Onuphis investigatoris** Fauvel. (Fig. 130, *a—f;* 131, *a—g*).

Onuphis investigatoris, Fauvel, 1932, p. 147, fig. 21, pl. VI, figs. 1—6.

Body elongated, depressed, about the same breadth all over, except the first 5—6 segments which are rounded, longer and narrower. Segments numerous. Palps oval globular. Two small oval or sub-cylindrical front tentacles. Five occipital tentacles with short, ringed, ceratophore and long, smooth, subulate cirrostyle. Median tentacle reaching backwards to the 7th setigerous segment, the outer pair reaching to the 15th. Eyes absent. Buccal segment (peristomium), which is shorter and narrower than the succeeding, bears two smooth filiform, tentacular cirri inserted in its anterior margin behind the lateral posterior tentacles. Dorsal cirri subulate in the first feet, swollen at their base in the succeeding ones. Ventral cirri subulate in the 6—7th feet. *There is no conical tubercle between the setigerous process and the base of the dorsal cirrus.* Gills begin on the 5th—6th foot, simple (or rarely bifid), bifid on the intermediate region, pectinate further back, with as many as 10 filaments. They continue to the last segments where they are again simple. Posterior ligule well developed in the first feet, in form of a short conical knob about the 12th—15th foot. The change is progressive. Pygidium, an oval knob with two long filiform cirri. Up to the 5th—6th setigerous seg-

ment, capillary setae and pseudo-compound hooks with bi-dentate or tri-dentate hooded terminal piece. In the succeeding segments, winged capillary setae and yellow,

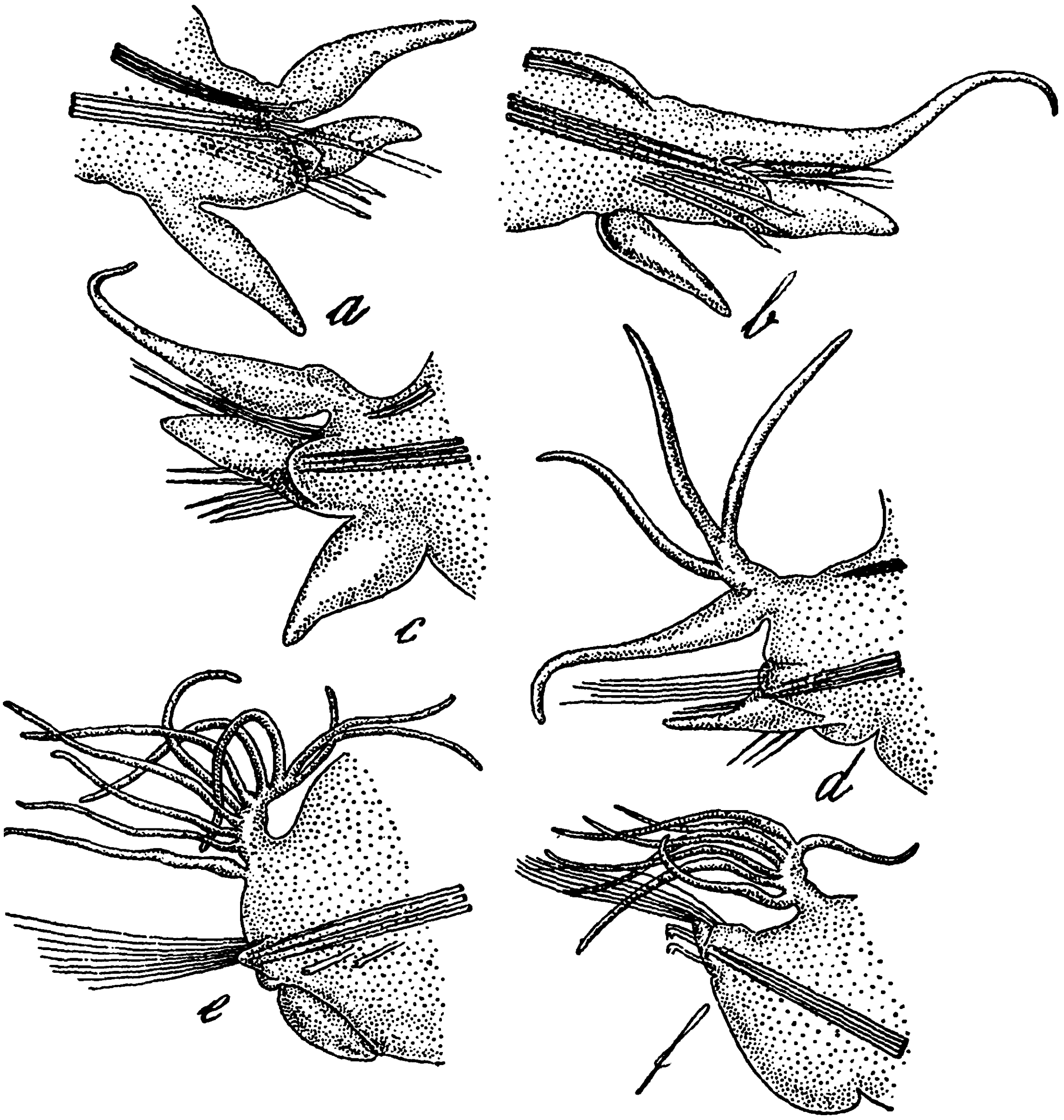


Fig. 130.—*Onuphis* investigations Fauvel, *a*, first foot ×20; *b*, fourth foot ×20; *c*, Sixth foot ×20; *d*, tenth foot ×20; *e*, 30th foot ×20; *f*, foot from mid-body ×20.

bi-dentate, hooded acicular setae. From about the 10th–15th foot, yellow acicula ending in a capillary tip. A bundle of very slender capillary acicula enclosed in the base of the dorsal cirri. Lower jaw soft, chitinous, elongate, with blackish outer edge. Jaws soft, pale edged, light brown. M. I.; 1+1 mandibles without basal teeth; M. II, 9+9; M. III, 10+10; M. IV, 7+12 to 13, with a triangular, dark, chitinous plate at the base. Tube thin, membranaceous, more or less coated with fine mud. A deep sea species.

Length: Up to 60 mm., or more, by 4–5 mm.

Colour: Discoloured in alcohol.

Occurrence: Laccadive Sea, Arabian Sea, Gulf of Oman, Persian Gulf, 35 fms. to 600–700 fms., in brown mud, grey mud, green mud or globigerina ooze.

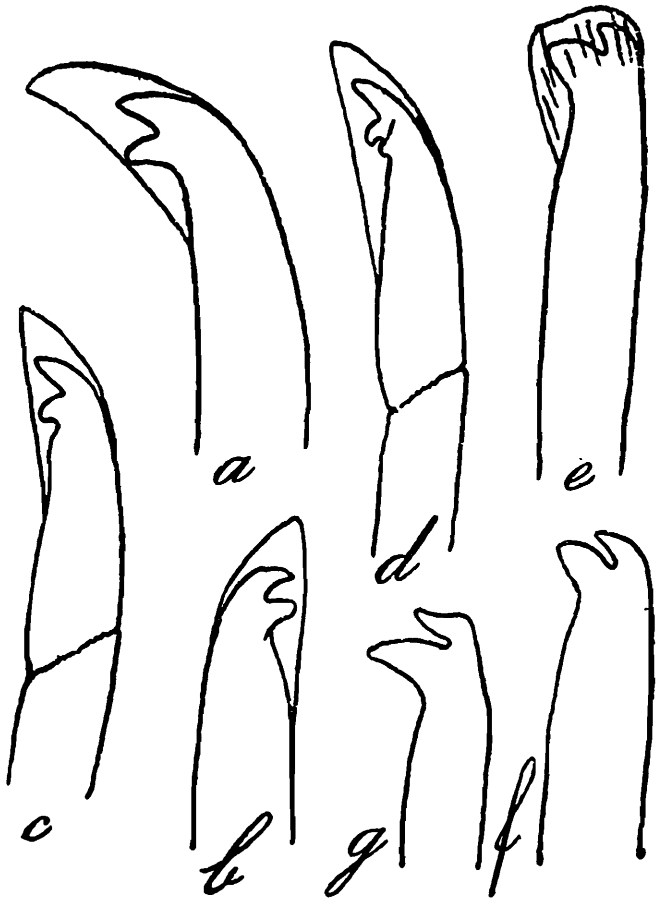


Fig. 131.—*Onuphis investigatoris* Fauvel: *a, b,* hooks from first foot ×270; *c, d,* hooks from 4th foot ×270; *e,* hooded hook from mid-body ×270; *f,* worn hook from mid-body ×270; *g,* hook enclosed in a foot from mid-body ×270.

Genus HYALINOECIA Malmgren.

Eyes present or absent. Two pad-like palps. Two small fusiform frontal tentacles. Five occipital tentacles, borne on ringed ceratophores. *An achaetous segment devoid of tentacular cirri.* Dorsal cirri subulate in the anterior feet, pad-like in the following ones. Simple or pseudo-compound hooks in the anterior feet, simple capillary setae, comb-setae and acicular setae in the succeeding ones. Gills generally simple. Lower jaw of two pieces. Upper jaw with a pair of mandibles, 2–3 pairs of toothed plates and an unpaired plate. Tube membranaceous or horny, sometimes free.

250. Hyalinoecia tubicola O. F. Muller. (Fig. 126, *i–q*).

Hyalinoecia tubicola, Fauvel, 1923a, p. 421, fig. 166, *i–g;* 1932, p. 149: Augener, 1924, p. 422: Monro, 1937, p. 293.

Onuphis tubicola, Ehlers, 1908, p. 83.

Hyalinoecia camiguina, Grube, 1878, p. 142: Willey, 1905, p. 279.

Gills simple, beginning about 18th–26th foot. The first two pairs of feet rather stout and pointing forwards, armed with simple capillary setae and stout hooks, bluntly bi-dentate and hooded (on young specimens they are pseudo-compound) *Tube free,* horny, transparent cylindrical, very slightly bent, open at both ends and provided with internal valves. It has the appearance and rigidity of a large goose quill.

Length of the tubes: 20–200 mm. by 8–10 mm. Hyaline, colourless or yellow. Animal up to 215 mm.

Occurrence: Bay of Bengal, Laccadive Sea, Arabian Sea, Gulf of Oman; in deep dredgings, down to 1,005 fms.

Distribution: Japan, New Zealand; Indian Ocean, Red Sea; Atlantic Ocean, Mediterranean Sea.

Genus RHAMPHOBRACHIUM Ehlers.

Two pad-like palps. Two small rounded frontal tentacles. Five occipital tentacles, borne on ringed ceratophores. An achaetous segment bearing two small tentacular cirri. Dorsal cirri subulate. Ventral cirri pad-like. Three anterior feet very large, directed forwards and bearing very long capillary bristles with a hooked end-piece. Gills pectinate. Lower jaw of two pieces. Upper jaw with a pair of mandibles, paired tooth-plates and an unpaired plate. Tube membranaceous.

Key to the species of Rhamphobrachium.

Compound bi-dentate hooks confined to the 4th foot ..	*diversosetosum* Monro, p. 262.
Pseudo-compound tri-dentate hooks on the 3rd foot ..	*chuni* Ehlers, p. 261.

251. Rhamphobrachium chuni Ehlers. (Fig. 132, *a–b*).

Rhamphobrachium chuni, Ehlers, 1908, p. 76, pl. IX, figs. 6–15: Augener, 1927, p. 178, fig. 8: Fauvel, 1932, p. 150.

Tentacles short, subulate, nearly equal, borne on short ringed ceratophores. Eyes absent. The three anterior feet flattened, nearly imbricated, directed forwards

and enclosing the head, provided with subulate dorsal and ventral cirri and very long and slender setae ending in a pseudo-articulate tri-dentate hook enclosed in a hood (it is smooth in grown-up specimens) Gills begin about 12th foot and consist of as many as 6 filaments. Tube membranaceous, covered with mud.

Length: 190 mm. by 4 mm.

Colour: Yellowish-grey with small dark dots on the anterior part and larger spots on the base of the dorsal cirri.

Occurrence: North Andaman Island: S. W. of Ceylon, 480 fms.; Laccadive Sea, 719 fms.

Distribution: New Zealand, Australia; Andaman Islands, Ceylon, Laccadive Sea, East Coast of Africa.

252. **Rhamphobrachium diversosetosum** Monro. (Fig. 132, *c—h*).

Rhamphobrachium diversosetosum Monro, 1937, p. 295, fig. 17.

Palps globular, frontal tentacles ovate. Occipital tentacles slender, with short ceratophores. Two small eyes. The three anterior feet are elongated and carried

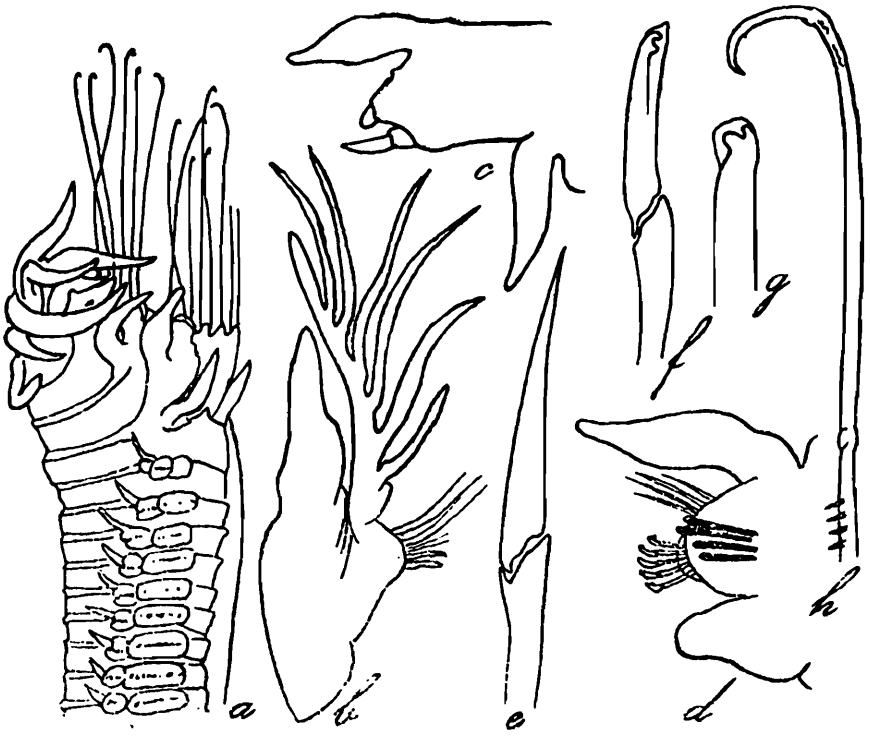


Fig. 132.—*Rhamphobrachium chuni* Ehlers: *a*, anterior part, side view ×4; *b*, 34th foot ×20 (after Ehlers). *Rh. diversosetosum* Monro: *c*, 2nd foot, bristles not figured; *d*, 4th foot; *e*, compound bristle from 10th foot; *f*, hook from 4th foot; *g*, acicular bristle; *h*, tip of hook from 2nd foot (after Monro).

forwards beside the head: they have large dorsal and ventral cirri and carry a cirriform process and the usual enormously long bristles with curved tip. There is no tri-dentate hook. *The 4th foot carries capillary bristles and compound bi-dentate hooks with sickle-shaped ends. These compound bristles are confined to the 4th foot.* For about the following 10 setigers the place of the compound bristles with sickle-shaped blades is taken by compound bristles with cultriform blades, which in turn disappear, their place being taken by a pair of yellow, bi-dentate, hooded, acicular hooks, and the four acicula are replaced by a pair of stout acicula with pointed ends. Comb-setae present. Gills begin with a simple filament at the 10th setiger and reach a maximum of about 8 filaments. On the terminal segment (52nd) of the larger fragment the gills are still richly branched.

Length: 19—30 mm. by 3 mm. and 52 setigers (incomplete)

Occurrence: Maldive Archipelago, 183—274 m.

Sub-family *LUMBRICONEREINAE.*

Palps absent. Tentacles missing. Prostomium more or less conical. Dorsal cirri rudimentary or missing. No ventral cirri. Branchiae absent, or very rarely present. Setae: simple winged capillary, compound or simple hooks. Four anal cirri. A lower jaw (labrum) Upper jaws 3—5 pairs, without unpaired plate.

Genus LUMBRICONEREIS Blainville.

Body long and cylindrical. Prostomium conical or globular, devoid of palps and tentacles. Eyes absent. First two segments apodous and achaetous. Dorsal cirri absent or reduced to a small knob. Ventral cirri absent. Gills absent. Feet with two unequal ligules. Simple winged setae and simple or compound hooks. Lower jaw (labium) bodica-like. Upper jaw with a pair of mandibles, three pairs of toothed plates and two supports.

Key to the species of Lumbriconereis.

1.	Capillary setae present. Hooks absent ..	2
	Capillary setae and hooks present	3
2.	Ligules of the feet short	*simplex* Southern, p. 264.
	Ligules of the feet long	*pseudobifilaris* Fauvel, p. 269

3. Two long cirriform ligules in the posterior feet	*bifilaris* Ehlers, p. 269.
A single cirriform ligule	4
4. Hooks compound and simple	5
Only simple hooks present	6
5. Prostomium conical	*latreilli* Aud. & M.-Edw., p. 266.
Prostomium globular	*sphaerocephala* Schmarda, p. 267.
6. Small dorsal cirri present	*notocirrata* Fauvel, p. 271.
Dorsal cirri absent	7
7. Long ligule in posterior feet	8
Ligules of posterior feet shorter and not erect. No capillary setae in posterior feet	*impatiens* Claparède, p. 267.
8. Long posterior ligules erect	*heteropoda* Marenzeller, p. 268.
Long posterior ligules not erect. Capillary setae in all feet	*polydesma* Southern, p. 264.

253. **Lumbriconereis simplex** Southern. (Fig. 133, *g–i*)

Lumbriconereis simplex, Southern, 1921, p. 625, pl. XXVI, fig. 16.

Prostomium triangular, with rounded angles. Feet very vascular, with a large heart-shaped structure full of blood. Anterior lobe rounded, posterior lobe blunt conical. *All the setae are simple, capillary,* more or less broadly winged. There are no hooks. Mandibles broad, fused throughout almost the whole length. Carriers short. Maxillae stout and boldly curved. M. III, bidentate, M. IV, a stout tooth which may be slightly bifid at the tip.

Length: 32 mm. by 1.7–2.7 mm.

Colourless, in spirit.

Occurrence: Chilka Lake, in mud.

254. **Lumbriconereis polydesma** Southern. (Fig. 133, *a–f*).

Lumbriconereis polydesma, Southern, 1921, p. 622, pl. XXVI, fig. 15.

Very slender elongated body. Prostomium rounded. Feet uniform in the middle and posterior parts, with an anterior short rounded lobe and a *posterior longer, conical or cirriform one.* Only capillary winged setae in the

28 anterior feet, which do not disappear in the middle and posterior feet. *The hooks, from the 29th foot, are all unjointed,* with 6—10 small denticles above the main fang. M. III bi-dentate; M. IV unidentate. Acicula colourless.

Length: 185 mm. by 1 mm.

Colour: In spirit opaque white with a faint green iridescence.

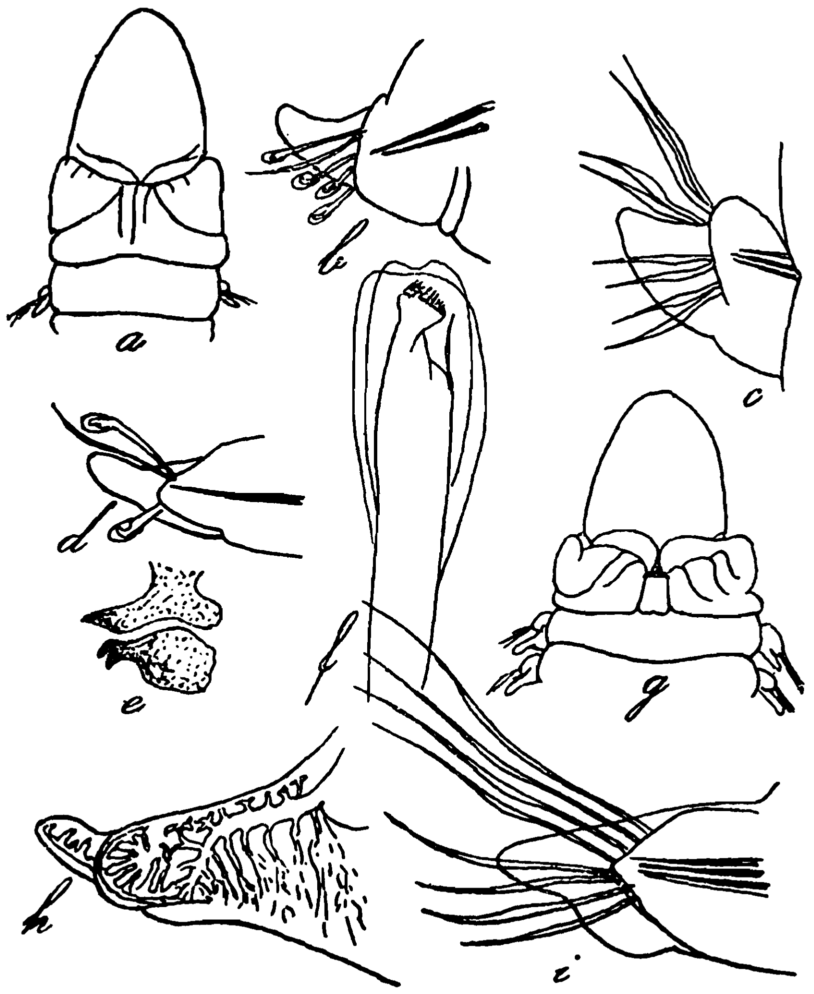


Fig. 133.—*Lumbriconereis polydesma* Southern: *a,* anterior end, ventral view ×20; *b,* 80th foot ×80; *c,* 10th foot ×90; *d,* 300th foot ×80; *e,* 3rd and 4th pairs of jaws ×45; *f,* hook ×435: *L. simplex* Southern: *g,* anterior end, ventral view; *h,* 100th foot, showing blood vessels ×60; *i,* 10th foot ×67 (after Southern).

Occurrence: In sand. just above high water mark, on the shore of Chiriya Island, Chilka Lake.

Remarks: This species is a connecting link between *L. impatients* Claparède and *L. heteropoda* Marenzeller, differing from the latter by its much shorter feet, which are not erect.

255. **Lumbriconereis latreilli** Audouin and Milne-Edwards. (Fig. 134, *m—r*)

Lumbriconereis latreilli, Fauvel, 1923a, p. 431, fig. 171 *n—r* (Synonymy); 1932, p. 152: Crossland, 1924, p. 10, figs. 8—40.
Lumbriconereis japonica, Marenzeller, 1879, p. 137, pl. V, fig. 3: Izuka, 1912, p. 139, pl. XIV, figs. 17, 18: Augener, 1926, p. 460, fig. 8.

Body narrowed anteriorly. Prostomium blunt conical. Feet well developed; setigerous process with an anterior rounded lobe and a posterior elongate conical ligule, which is greatly elongated in the posterior seg-

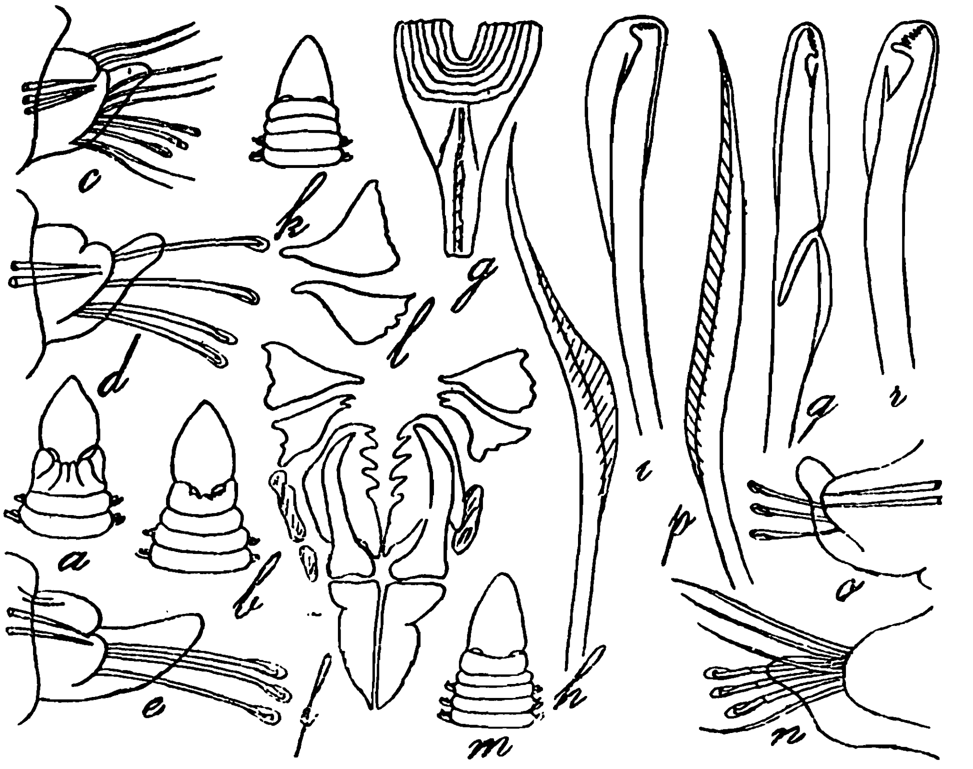


Fig. 134.—*Lumbriconereis impatiens* Claparède: *a, b,* head dorsal and ventral view ×3; *c,* anterior foot; *d,* foot from mid-body ×78; *e,* posterior foot ×78; *f,* upper jaws ×12; *g,* lower jaw ×12; *h,* winged capillary ×117; *i,* posterior hook ×117. *L. fragilis* O. F. Müller: *k,* head ×4; *l,* 3rd and 4th jaws ×12. *L. latreilli* Aud. & M. Edw.: *m,* head ×3; *n,* 10th foot ×78; *o,* foot from mid-body ×78; *p,* capillary bristle ×155; *q,* anterior compound hook ×233; *r,* unjointed hook ×233.

ments. In the anterior feet capillary setae and compound hooks; in the succeeding feet, unjointed hooks. The capillaries disappear about 40th—60th feet. The variety *japonica* is hardly distinct.

Length: 50—150 mm.

Colour: Pink, red or brown, in life. Colour in alcohol red.

Occurrence: Ceylon, Tuticorin Pearl-Oyster Banks.

Distribution: Pacific Ocean; Indian Ocean, Maldive Archipelago, Persian Gulf, Red Sea; Atlantic Ocean, Mediterranean Sea.

256. **Lumbriconereis sphaerocephala** Schmarda. (Fig. 135, *c—f*)

Lumbriconereis sphaerocephala, Augener, 1924, p. 424; 1927, p. 88: Ehlers, 1904, p. 33, pl. V, fig. 3—11: Fauvel, 1930a, p. 30; 1930b, p. 540; 1932, p. 152.

(?) *Lumbriconereis obtusa* Kinberg, Augener, 1926, p. 459.

Prostomium short, globular. Feet with an anterior rounded lobe and a posterior longer conical ligule, slightly more elongated in the posterior feet. In the anterior feet, capillary setae and compound hooks with short terminal piece, followed by simple hooks with denticles above the main fang.

Length: 30—40 mm.

Occurrence: Andaman Islands; Ceylon.

Distribution: New Zealand, New Caledonia, Gambia Islands, Tasmania, Bass Straits, Indo-China; Andaman Islands, India.

257 **Lumbriconereis impatiens** Claparède. (Fig. 134, *a—i*)

Lumbriconereis impatiens, Fauvel, 1923a, p. 429, fig. 171 *a—i* (Synonymy); 1932, p. 152: Augener, 1918, p. 364: Monro, 1937, p. 297.

Prostomium cylindro-conical. Feet with an anterior short, rounded lobe and a posterior longer, conical, or cirriform ligule, slightly erect. Acicula yellow. In the posterior feet, simple winged and unjointed hooks with denticles above the main fang and a long guard. In the middle and posterior feet, the capillaries disappear and the guard of the hooks is shorter.

Length: 150—300 mm.

Colour: In alcohol a lilac-red.

Occurrence: Ganjam Coast; Vizagapatam; Laccadive Sea; Maldive Archipelago; Persian Gulf.

Distribution: Maldive and Laccadive Archipelagoes, India, Persian Gulf, Red Sea; Atlantic Ocean, Mediterranean Sea.

258. Lumbriconereis heteropoda Marenzeller. (Fig. 135, *g—h*)

Lumbriconereis heteropoda, Marenzeller, 1879, p. 30, pl. VI, fig. 1: Izuka, 1912, p. 141, pl. IV, fig. 19: Crossland, 1924, p. 4, figs. 1—7: Fauvel, 1930a, p. 30; 1932, p. 158: Monro, 1937, p. 297.

Lumbriconereis erecta, Moore, 1903, p. 454.

Prostomium conical. Feet increase in length posteriorly, with posterior cirriform ligule long and often

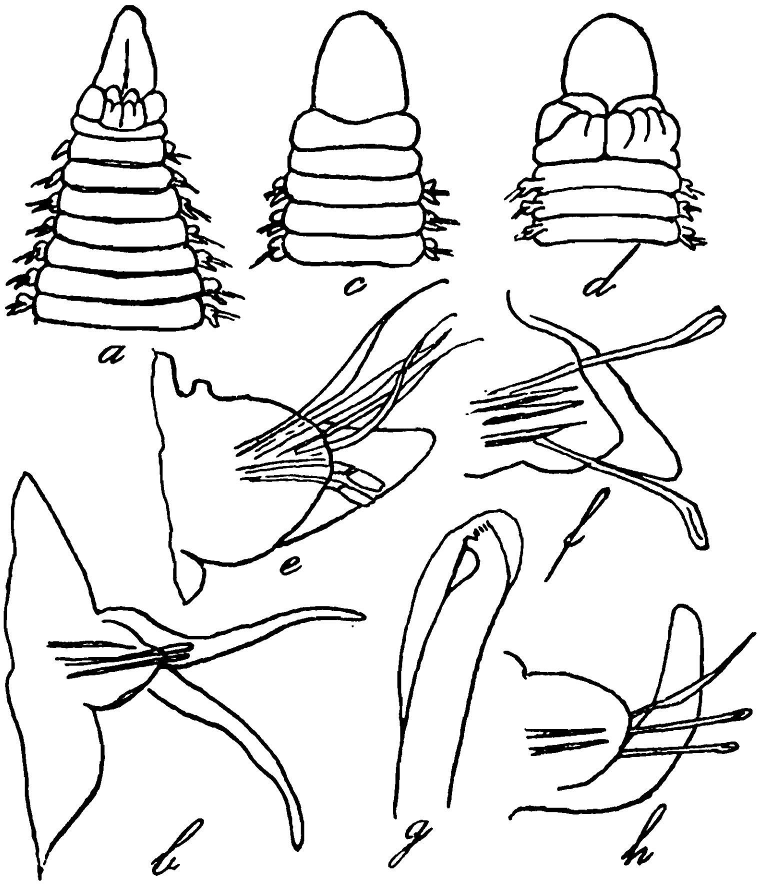


Fig. 135.—*Lumbriconereis bifilaris* Ehlers: *a*, anterior part ×20; *b*, 105th foot ×52. *L. sphaerocephala* Schmarda: *c*, *d*, anterior part, dorsal and ventral view ×16; *e*, 4th foot ×70; *f*, 60th foot ×52 (after Ehlers). *L. heteropoda* Marenzeller: *g*, hook; *h*, hind foot.

erect. Only simple capillary setae in the anterior feet, followed by winged capillaries and unjointed hooks with small denticles above the main fang.

Remarks: differs from *L. impatiens* Claparède in having only winged capillary setae in the 10—40 anterior feet and the longer posterior ligules erect, or turned backwards, in the middle and posterior feet.

Length: 150—300 mm.

Occurrence: Portuguese India, Mormugao Bay; Bombay; Persian Gulf.

Distribution: Japan, Indo-China; India, Persian Gulf, Red Sea.

259. **Lumbriconereis bifilaris** Ehlers. (Fig. 135, *a—b*).

Lumbriconereis bifilaris, Ehlers, 1901, p. 139, pl. XVIII, figs. 1—10: Fauvel, 1932, p. 153.

Body long and slender. Prostomium long, conical. Anterior feet with two rounded lips, the anterior shorter than the posterior. Posteriorly they gradually change to two very long cirriform processes of about equal length. In the anterior feet winged capillary setae and unjointed hooks with small denticles above the main fang and a long guard. About the 55th foot, only hooks with shorter guard.

Length: About 110 mm. by 1 mm.

Occurrence: Taleh-Sap, Gulf of Siam.

Distribution: Coast of Chile; Taleh-Sap; Atlantic Ocean, Coast of Morocco.

260. **Lumbriconereis pseudobifilaris** Fauvel. (Figs, 136, *a—g*, 137, *a—d*)

Lumbriconereis pseudobifilaris, Fauvel, 1932, p. 154, text fig. 22, pl. VI, figs. 7—13.

Body cylindrical, deeply annulated. Prostomium conical, rather sharp, eyeless. The first two achaetous segments each about the same size as the following. On the ventral side of the peristomium, three longitudinal grooves reaching across the next segment. Two large lateral mouth-pads. Anterior feet with a short rounded anterior lip and a posterior one tapering at the tip. On the succeeding segments the lips, or ligules, of the feet increase in length and become cirriform, but the anterior one remains shorter and blunter than the posterior one. Setigerous lobe rounded, flattened between the lips and bearing only capillary winged setae, which are short in the first segments. Farther back, they are less numerous and have a yellow cylindrical shaft and a broad, flattened, transparent, sabre-like distal part ending in a long slender tip, straight or bent. *Hooks absent.* Several dark acicula. Dorsal and ventral cirri absent. Lower jaw (labrum) whitish, broad and denticulate. Upper jaws; mandibles with long smooth fang destitute of basal teeth, two very

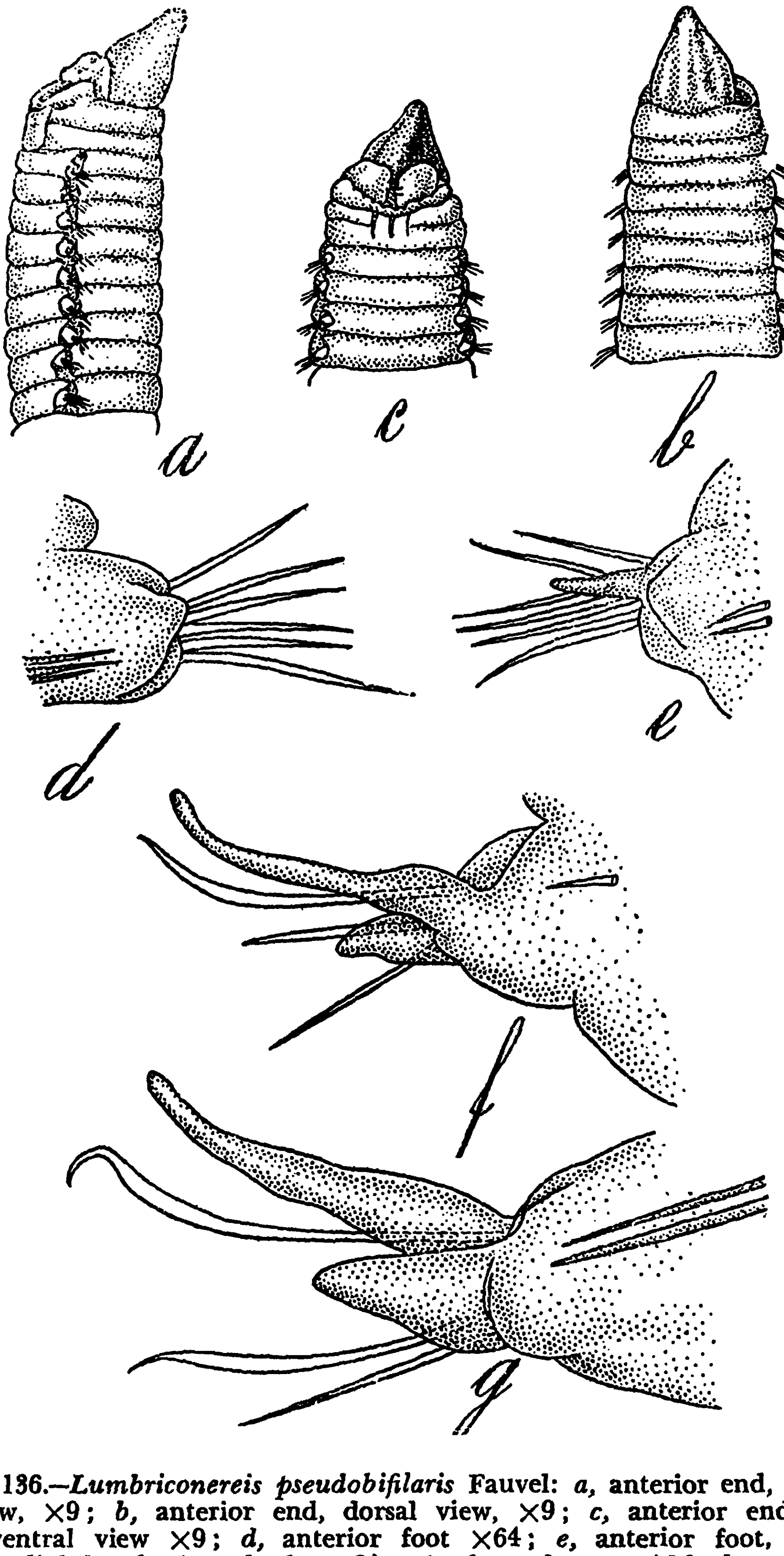


Fig. 136.—*Lumbriconereis pseudobifilaris* Fauvel: *a*, anterior end, side view, ×9; *b*, anterior end, dorsal view, ×9; *c*, anterior end, ventral view ×9; *d*, anterior foot ×64; *e*, anterior foot, slightly farther back ×64; *f*, foot from mid-body ×90; *g*, posterior foot ×64.

long and slender dark supports; M. II, two symmetrical plates with 5 teeth on the right and 8 on the left; M. III, two dark hooked plates with several fine denticles on the edge.

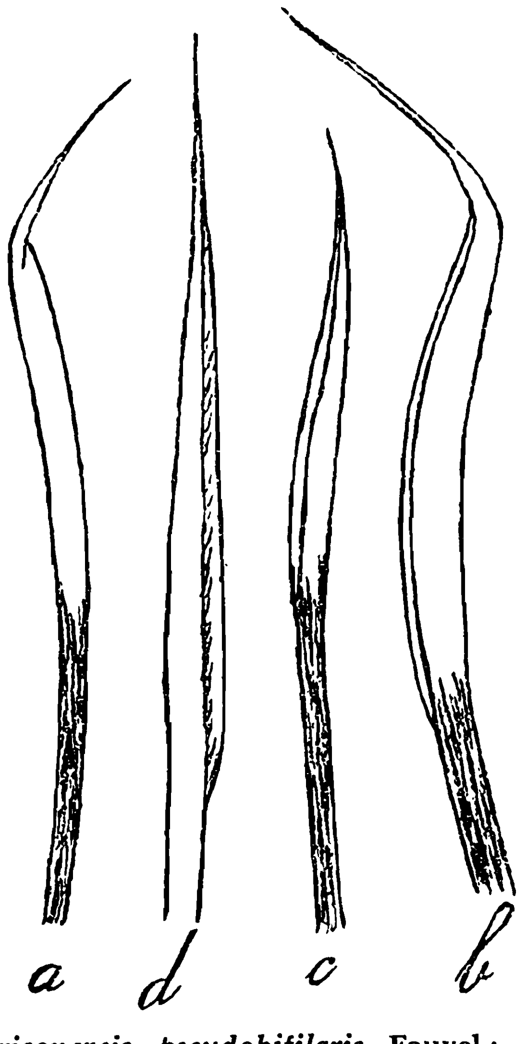


Fig. 137.—*Lumbriconereis pseudobifilaris* Fauvel: *a, b,* flat setac ×220; *c, d,* winged setae ×220

Length: Up to 40 mm. or more by 2 mm.

Colour: In spirit, iridescent pearl-grey.

Occurrence: Off Akyab, Burma, 250 fms. in soft green mud; West Narrakal, Cochin State; Travancore.

261. **Lumbriconereis notocirrata** Fauvel. (Figs. 138, *a—h;* 139, *a—d*)

Lumbriconereis notocirrata, Fauvel, 1932, p. 156, pl. VII, figs. 1—8, text, fig. 23.

Body cylindrical, conspicuously annulate, segments up to several hundreds. Prostomium blunt, conical, without eyes. The first two achaetous segments equal and the same length as the succeeding ones. The ventral side

of the peristomium divided into faint longitudinal furrows which do not extend on to the next segment. Two lateral mouth pads. Feet of the anterior segments small, succeeding ones with a setigerous process with two ligules, an anterior short and rounded, and a posterior long and conical, becoming more and more elongated poster-

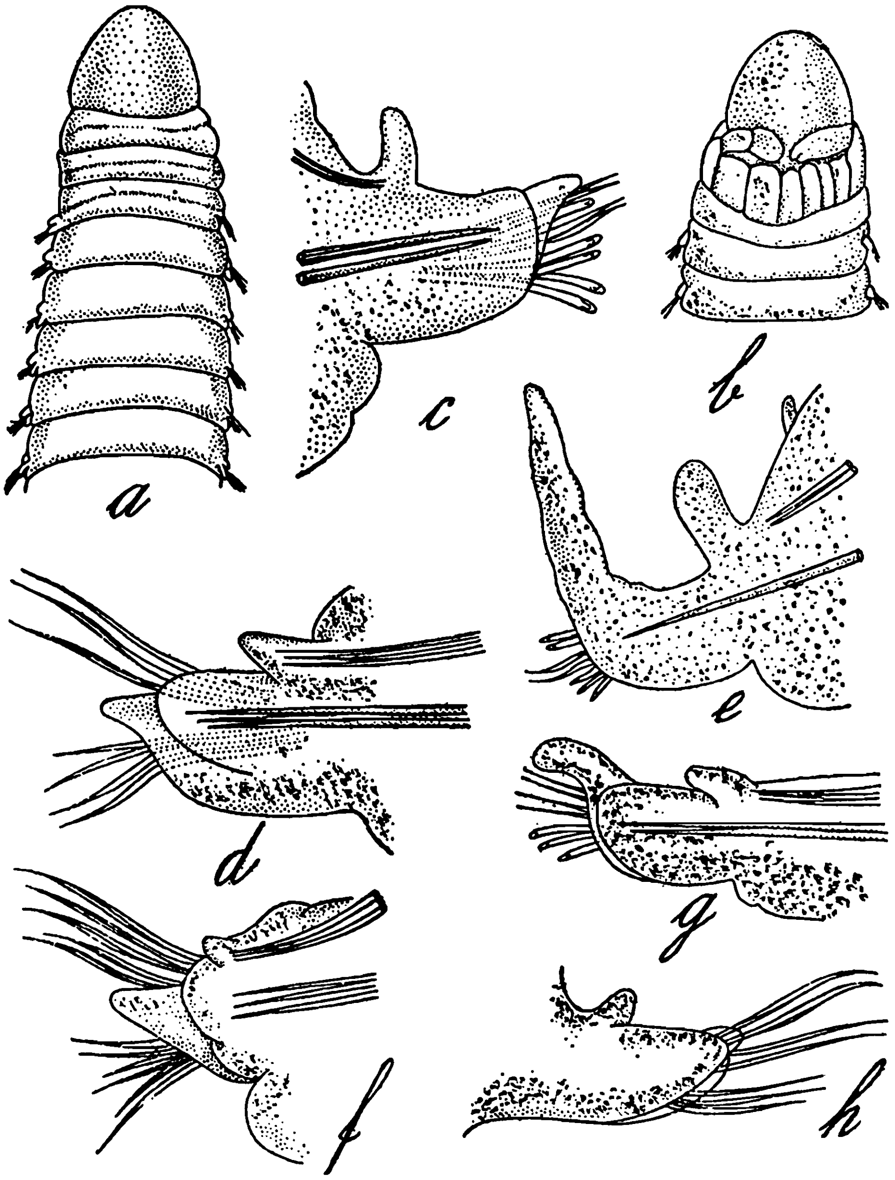


Fig. 138.—*Lumbriconereis notocirrata* Fauvel: *a,* anterior end, dorsal view ×5; *b,* anterior end, ventral view ×5; *c,* foot from mid-body ×25; *d,* anterior foot ×25; *e,* posterior foot ×25; *f,* anterior foot ×25; *g,* foot from mid-body ×25; *h,* semi-anterior ×25.

iorly, and erect in the middle region and posterior segments. Dorsal cirrus reduced to a small knob in the anterior feet; long and finger-like in the middle; bent, erect, and translucent in the posterior region, where the feet are long and protruding. In the hind part of the body, a little above and in front of the base of the foot,

the border of the segment protrudes as a small dorsal knob, or a transparent vesicle. Acicula yellow, four in the anterior feet, followed by three, two, or only one, in the posterior feet. A small bundle of very fine acicula enclosed in the base of the dorsal cirrus. In the anterior feet, smooth, sword-like, capillary setae with an unpaired wing; in the succeeding ones, simple setae and simple hook, with bifid tip and rounded guard. In the posterior

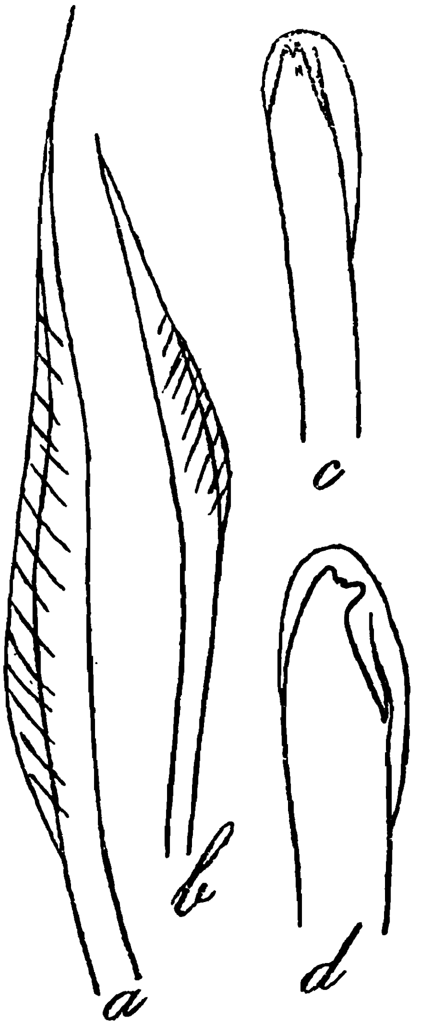


Fig. 139.—*Lumbriconereis notocirrata* Fauvel: *a*, anterior seta ×270; *b*, seta from mid-body ×270; *c*, hook ×270; *d*, hook-tip ×380.

feet, hooks and 1—2 capillary setae. Lower jaw (labrum) black, short, broad, with parallel semi-circular streaks and a faintly denticulate anterior border. Upper jaws with long lanceolate supports. Mandibles with a smooth base; M. II, two symmetrical plates with 4+4 teeth; M. III, 2+2; M. IV, 1+1.

Length: 350 mm. or more, by 8 mm.

Colour: In spirit. Pale salmon-colour, with traces of transverse pale brownish-red streaks.

Occurrence: Vizagapatam, channel connecting backwaters with the sea and beyond the ferry; Orissa Coast, 7 fms.

Genus ARABELLA Grube.

Syn. *Aracoda* Schmarda; *Mactovia* Grube.

Prostomium ovate, devoid of palps and tentacles. Eyes present. First two segments apodous and achaetous. Dorsal cirri reduced to a mere tubercle. Ventral cirri absent. Feet with two unequal ligules. Simple winged setae. Lower jaw of two short pieces. Upper jaw with a pair of mandibles and 3—4 more or less asymmetrical pairs of toothed plates. Two or three long supports.

Key to the species of Arabella.

Acicular setae with peculiar asymmetrical hood ..	*nutans* (Chamberlin), p. 275.
No such setae	*iricolor* (Montagu), p. 274.

262. Arabella iricolor (Montagu) (Fig. 140, *a—h*)

Arabella iricolor, Fauvel, 1923a, p. 438, fig. 175 (Synonymy); 1932, p. 158: Augener, 1924, p. 430.
Aracoda multidentata, Augener, 1913, p. 291.

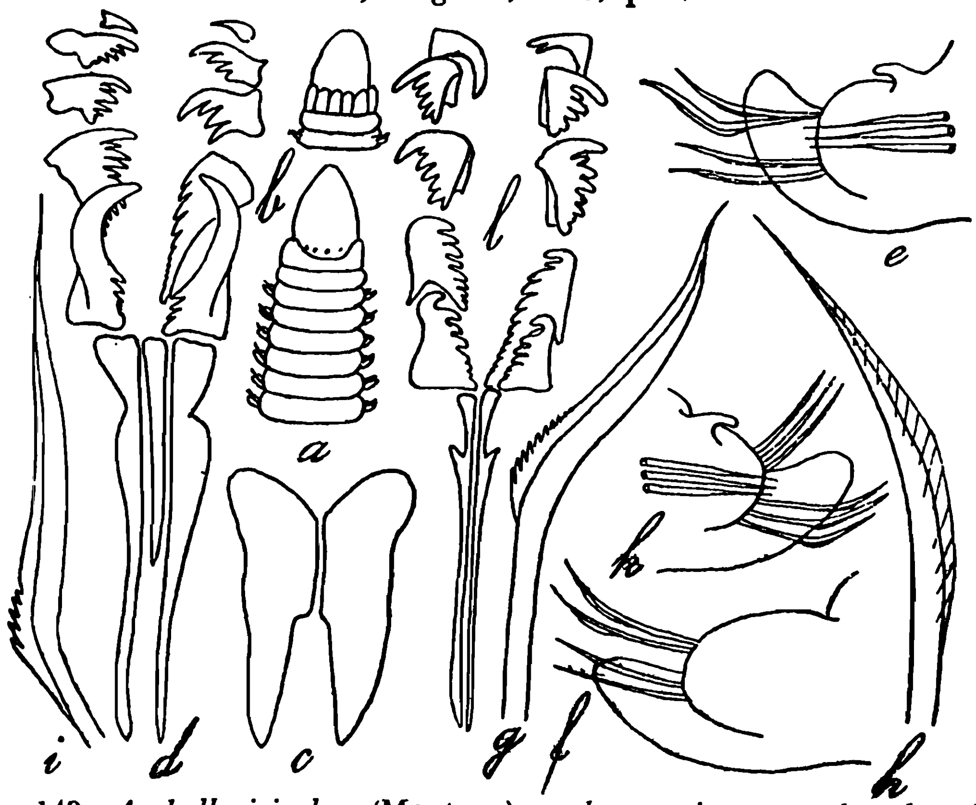


Fig. 140.—*Arabella iricolor* (Montagu): *a, b,* anterior part, dorsal and ventral view ×4; *c,* lower jaw ×23; *d,* upper jaws ×31; *e,* anterior foot ×39; *f,* hind foot ×39; *g,* upper bristle, kneed and crenulate ×117; *h,* lower winged capillary ×117. *A. geniculata* (Claparède) (a species conspecific with *A. mutans* (Chamberlin) ?): *i,* crenate bristle ×117; *k,* anterior foot ×39; *l,* upper jaws.

Prostomium blunt, conical, with four eyes set near the posterior margin in a transverse line. Dorsal cirri reduced to a small bent knob, often wanting in the posterior part of the body and on young specimens. All the setae are simple, short, stout, geniculate; the upper ones with a denticulate crest, the lower ones with smooth wings. The mandibles are large dark hooks with a toothed base.

Length: 50—120 mm.

Colour: Body grey, iridescent, sometimes with transverse rows of dark dots in the anterior segments.

Occurrence: Camorta Island, Nicobar Islands; Madras Coast, Vizagapatam; Gulf of Mannar, Krusadai Island, Pamban, Shingle Island.

Distribution: Cosmopolitan; Pacific, Indian and Atlantic Oceans.

263. **Arabella mutans** (Chamberlin) (Fig. 140, *i—l*; Fig. 143, *g—i*)

Arabella mutans, Monro, 1933, p. 88: Fauvel, 1943, p. 24.

Cenothrix mutans, Chamberlin, 1919, p. 330, pl. XLI, fig. 1—9, pl. LXII, fig. 1.

Arabella novecrinita, Crossland, 1924, p. 71, figs. 89—95.

(?) *Aracoda obscura*, Willey, 1905, p. 285, pl. V, figs. 108—112.

Prostomium a pointed cone with four eyes at its base. Feet prominent though small. Dorsal cirri rudimentary. Setae include: (1) capillaries with narrow plain borders; (2) capillaries with broad borders bearing denticles proximally; (3) *acicular setae with peculiar asymmetrical hoods*. Acicula yellow. Jaws almost perfectly symmetrical: in var. *logani*, the first pair is nearly so, the second asymmetrical; in var. *asymmetrica*, while one of the first pairs ends in a long slender hook as usual, the other is toothed nearly its whole length, as in the genus *Notocirrus*.

Length: Up to 500 mm. by 2—3 mm.

Colour: Flesh colour or orange. Dark in spirit, sometimes with green dots.

Remarks: The jaws of *Aracoda obscura* Willey, a very small (16 mm.) dark specimen from Ceylon, agree with those of *A. mutans* var. *asymmetrica* Crossland. The specimens from the Maldives belong to the typical form with jaws almost perfectly symmetrical.

Occurrence: Ceylon (?), Maldive Archipelago.

Distribution: California, Galapagos Islands; India (?), Maldive Archipelago, Suez, Zanzibar; Cape Verde Island.

Genus DRILONEREIS Claparède.

Body elongated cylindrical. Prostomium devoid of palps and tentacles. Eyes may be present. The first two segments apodous and achaetous. Dorsal cirri reduced to a mere tubercle. Gills and ventral cirri absent. Feet with two unequal lobes. Simple winged setae and a large acicular spine. Lower jaw small, or sometimes missing. Upper jaw with a pair of mandibles, a pair of toothed plates, and 2—3 pairs of small hooks.

Key to the species of Drilonereis.

Prostomium small, lanceolate, flattened	*filum* Claparède, p. 276.
Prostomium almost circular in outline, peculiarly ridged on dorsal surface	*major* Crossland, p. 277.

264. Drilonereis filum Claparède. (Fig. 141, *a—h*).

Drilonereis filum, Fauvel, 1923a, p. 436, fig. 174, *a—h*, (Synonymy); 1932, p. 159.

Body long and slender. Prostomium lanceolate, flattened, often with a longitudinal median groove. Two dark spots at the base. Peristomium with ventral longi-

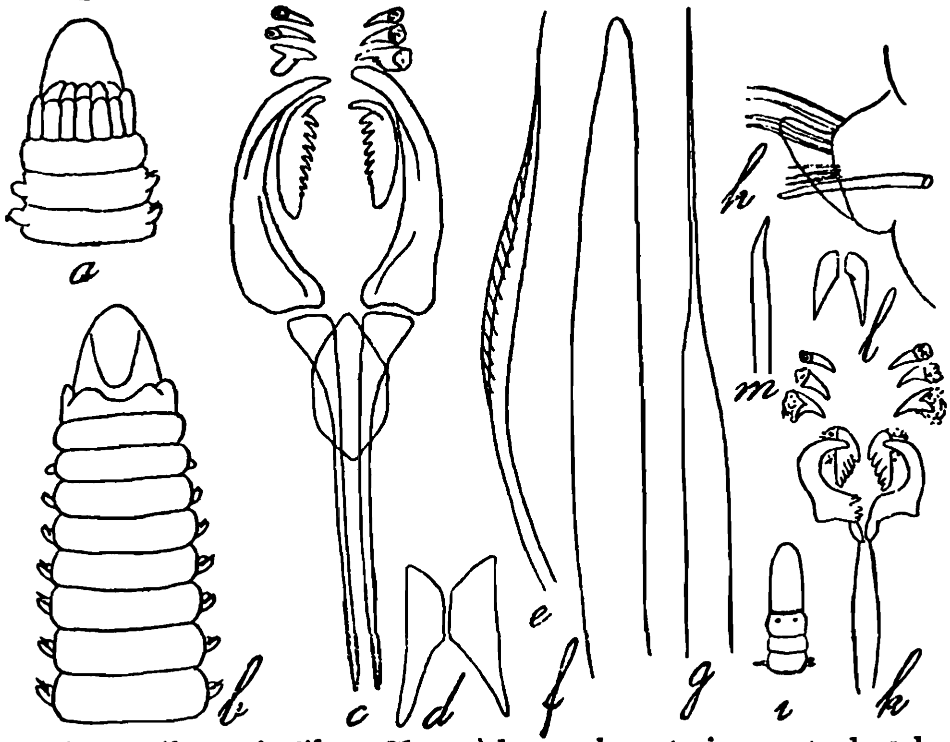


Fig. 141.—*Drilonereis filum* Claparède : *a, b,* anterior part, dorsal and ventral view ; *c,* upper jaws ; *d,* lower jaw ; *e,* winged capillary ×120; *f,* acicular bodkin-like bristle ×120 ; *g,* tip of aciculum ×310 ; *h,* foot ×8. *Dr. macrocephala* Saint-Joseph : *i,* head ×9 ; *k,* upper jaws ; *l,* lower jaw ; *m,* acicular bristle, (Not yet found in the Indian area).

tudinal folds. Feet with an anterior rounded lobe and a posterior long, blunt, conical one. Dorsal cirrus reduced to a mere knob with five enclosed acicula. Capillary setae with two wings set at an angle. *A very large blunt acicular bristle.* Acicula with a filiform protruding tip.

Remarks: The dark spots on the back of the prostomium are pigmented nuchal organs.

Length: 40–120 mm. by 2 mm.

Colour: In life pink, yellow or grey-green.

Occurrence: Off Akyab, Burma.

Distribution: Gambier Islands; Bay of Bengal, Persian Gulf, Red Sea; Atlantic Ocean.

265. **Drilonereis major,** Crossland. (Fig. 143, *k, l*).

Drilonereis major, Crossland, 1924, p. 57, figs. 73–79: Fauvel, 1932, p. 159.

Body large, up to 430 mm. *Prostomium flat, almost semi-circular* in outline, peculiarly ridged on dorsal surface. No sense organs of any kind (?). Setae all simple, the long capillaries slender, but slightly bent and not distinctly bordered. A very large blunt acicular bristle. Jaws of normal type. No teeth on bases of mandibles. Accessory plate of supports triangular, generally more or less equilateral. Rudiments of labrum usually absent, sometimes conspicuous.

Length: 200–450 mm. by 3 mm.

Occurrence: Bay of Bengal.

Distribution: Bay of Bengal, Gulf of Suez.

Genus NINOË Kinberg.

Prostomium conical. Palps and tentacles absent. The first two segments apodous and achaetous. *Gills filaments cirriform, sessile.* Simple setae, and hooks. Four pairs of upper jaws. Labrum of two pieces.

266. **Ninoë chilensis** Kinberg. (Fig. 142)

Ninoë chilensis, Kinberg, 1857, 1910, p. 45, pl. XVIII, fig. 32: Ehlers, 1904, p. 141: Fauvel, 1932, p. 160, pl. VII, fig. 18.

Prostomium conical, rather long, eyeless. Nuchal organs present. Dorsal and ventral cirri missing in the anterior feet; further back, a large flattened process above the gills is, perhaps, a modified dorsal cirrus. Gills rudimentary on the second foot, they have three filaments on the third and their number may reach beyond 10–12. They are well developed on about 30 segments, then they

dwindle and suddenly disappear. They represent the posterior lip of the feet. Behind the branchial region the feet are like those of *Lumbriconereis,* with a short rounded setigerous process, devoid of cirri, and with simple winged setae and long simple hooks.

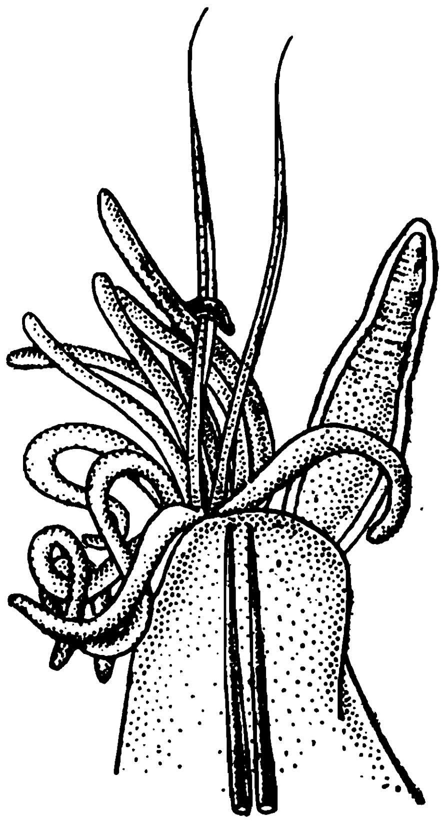


Fig. 142.—*Ninoë chilensis* Kinberg, twelfth foot ×60.

Length: 10—30 mm.

Occurrence: Bay of Bengal, 105 fms.

Distribution: Coast of Chile; Bay of Bengal.

Sub-family *STAUROCEPHALINAE.*

Two palps. Two tentacles. A labrum. Upper jaw with four rows of very numerous toothed plates. Parapodia sesquiramous. Simple and compound setae. Dorsal and ventral cirri. Gills absent. Four anal cirri.

Genus STAUROCEPHALUS Grube.

Syn. *Prionognathus* Keferstein; *Dorvillea* Parfitt; *Stauronereis* Verrill; *Anisoceras* Grube.

Two long palps, two tentacles, 2—4 eyes, two nuchal organs. A lower jaw (labrum). Upper jaw, several rows of maxillary teeth on each side. First two segments

achaetous. Sesquiramous parapodia. Dorsal cirri jointed, ventral cirri unjointed. Upper setae simple capillaries, geniculated or forked; lower setae compound, falciger, or spiniger.

Key to the species of Staurocephalus.

Dorsal cirri unjointed. Without forked setae	*gardineri* Crossland, p. 280.
Dorsal cirri jointed. Forked setae	*incertus* Schmarda, p. 279.

267 **Staurocephalus** incertus (Schmarda). (Fig. 143, *a—c*).

Cirrosyllis incerta, Schmarda, 1861, p. 79.
Stauronereis incerta, Ehlers, 1904, p. 36.
Stauronereis australis, Augener, 1913, p. 293.
Staurocephalus australis, Haswell, 1886, p. 747, pl. LIII, figs. 1—5; Fauvel, 1930, p. 32.

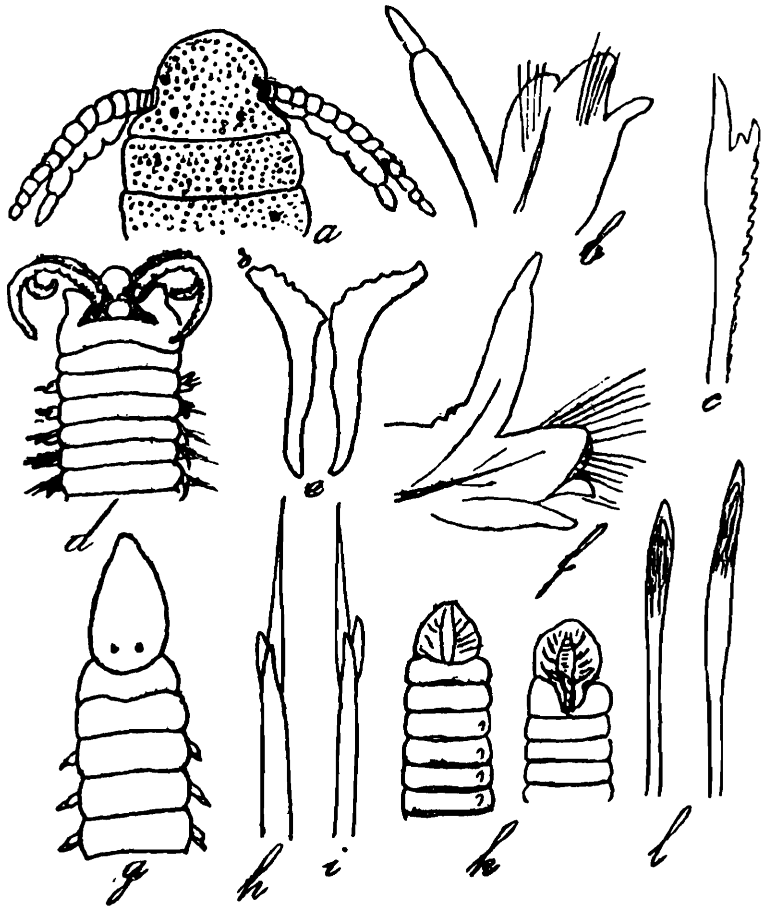


Fig. 143.—*Staurocephalus incertus* (Schmarda): *a,* head; *b,* foot; *c,* forked bristle (after Haswell). *St. gardineri* Crossland; *d,* anterior part, dorsal view ×5; *e,* lower jaw ×12; *f,* 20th foot ×12. *Arabella mutans* (Chamberlin): *g,* anterior region, dorsal view ×12; *h, i,* two hooded acicular bristles ×270; *Drilonereis major* Crossland: *k,* anterior part, dorsal and ventral view ×5; *l,* two forms of acicular bristles (after Crossland).

Prostomium rounded. 1—2 pairs of eyes. No nuchal papilla. Two tentacles with 6—13 joints; they are not much longer than the palps, which are faintly wrinkled, with a short terminal piece. There is no dorsal cirrus on the first segment. Dorsal cirri rather short, two-jointed, with the cirrophore longer than the cirrostyle. On the first segment 1—2 capillary setae and a short bent seta. Ventral setae compound, with a long sickle-shaped end-piece, gradually decreasing in size. The forked Y-shaped setae with very unequal limbs, begin on the second setigerous segment. Four anal cirri. Toothed maxillary plates in two rows on each side.

Length: 3—8 mm.

Colour: Light-red.

Occurrence: Shingle Island, Gulf of Mannar.

Distribution: New Zealand, Australia, Pacific Ocean; Indian Ocean.

268. **Staurocephalus gardineri** Crossland. (Fig. 143, *d—f*).

Staurocephalus (*Dorvillea*) *gardineri*, Crossland, 1924, p. 93, figs. 112—118.

Body of large size. Prostomium rounded, remarkably flattened. Two pairs of eyes (?) Tentacles jointed, same length as wrinkled palps. A nuchal papilla present. No dorsal cirrus on the first segment (?). Dorsal cirri long, thick below, *gradually passing to a point; there is no end-joint*. It is supported by the usual very slender aciculum. A stout aciculum in the foot. Dorsal setae slender, slightly curved, finely denticulated along the convex edge and ending in one or two very minute hooks. *No forked setae occur*. A longer ventral bundle of compound setae with a long bi-dentate sickle-shaped end-piece of gradually decreasing size; the shaft is not denticulated. Toothed maxillary plates in two rows on each side.

Length: 50 mm. by 2.5—4 mm. 100 segments.

Occurrence: Hulule, Male Atoll, Maldive Archipelago.

Distribution: Maldive Archipelago; Off Wasin, East Africa.

Incertae sedis.

269. **Eunice teretiuscula** Schmarda 1861, p. 129, pl. XXXII, fig. 259.

From Ceylon. Is a *Marphysa*.

270. **Diopatra phyllocirra** Schmarda, 1861, p. 133, pl. XXXII, fig. 261.

From Ceylon. *Diopatra neapolitana* Delle Chiaje?

271. **Diopatra malabarensis** Quatrefages 1865, p. 346. From Malabar. Very likely an *Onuphis* spec. (?)

272. **Tradopia maculata** Baird 1870, p. 355. From Madras. An *Onuphis* (?).

273. **Notocirrus trigonocephalus** Schmarda, 1861, p. 118. From Ceylon. A *Lumbriconereis* spec. ind.

274. **Lumbriconereis indica** Kinberg, 1857–1910; p. 48, pl. XIX, fig. 40.

From Bangka Straits. Insufficiently characterised.

Family GLYCERIDAE Grube.

Body elongated, tapering at both extremities; segments numerous, bi- or tri-annulate. Prostomium conical, ringed, with four small tentacles at the tip. Proboscis long, cylindrical or club-shaped, beset with papillae and armed with horny jaws. Parapodia biramous (*Hemipodus* excepted) Branchiae compound, simple or absent, often retractile. Dorsal setae simple, capillary; ventral setae compound.

Key to the sub-families of GLYCERIDAE.

Body divided into 2–3 regions	GONIADINAE, p. 281.
Body not divided into regions	GLYCERINAE, p. 289.

Sub-family *GONIADINAE.*

Body divided into 2–3 regions. Jaws and paragnaths numerous. Anterior feet uniramous, middle and posterior biramous. Posterior region flattened.

Key to the genera of GONIADINAE

1. Body divided into three regions	*Goniadopsis* Fauvel, p. 285.
Body divided into two regions	2
2. Lateral V-shaped paragnaths on the base of the proboscis	*Goniada* Aud. & M.-Edw., p. 281.
Lateral V-shaped paragnaths absent	*Glycinde* Müller, p. 288.

Genus GONIADA Aud. & M.–Edwards.

Body divided into two regions, the posterior one broader and flattened. Proboscis beset with papillae.

Two large horny jaws and a number of paragnaths. On each side of the base of the proboscis, a longitudinal row of V-shaped paragnaths (chevrons) Anterior feet uniramous, those of the posterior region biramous. Branchiae absent. Dorsal setae simple, ventral setae compound.

Key to the species of Goniada.

1. Dorsal setae few, stout, acicular	*emerita* Aud. & M.-Edw., p. 282.
Dorsal setae slender, capillary	2
2. Dorsal posterior rami with two ligules; ventral rami with three triangular ligules	*annulata* Moore, p. 283.
Dorsal posterior rami with one ligule; ventral rami with two triangular and a broad rounded ligule	*eximia* Ehlers, p. 285.

275. **Goniada emerita** Aud. & M.—Edw. (Fig. 144, *h—q*).

Goniada emerita, Fauvel, 1923a, p. 391, fig. 154; 1932, p. 120: Ehlers, 1868, p. 718, pl. XXIV, figs. 49—51.

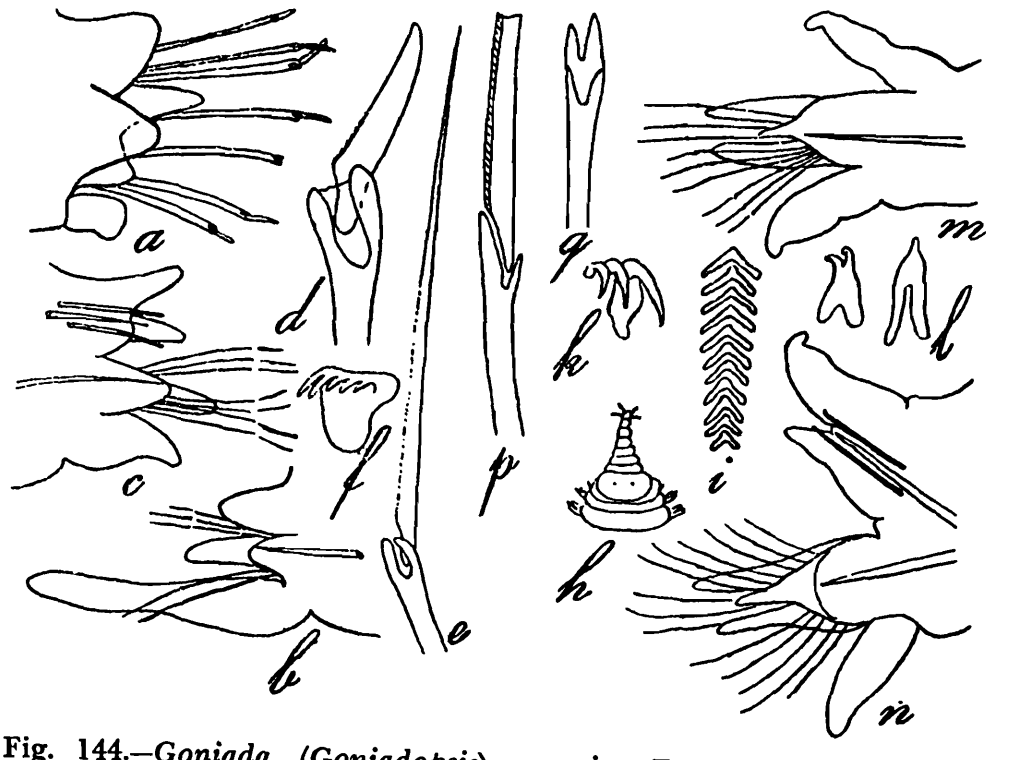


Fig. 144.—*Goniada* (*Goniadopsis*) *agnesiae* Fauvel: *a*, anterior foot ×66; *b*, foot from intermediate region ×66; *c*, foot from the posterior region ×66; *d*, huge, short falcigerous bristle from the anterior region ×270; *e*, posterior compound bristle with long end-piece ×270; *f*, jaw ×46. *Goniada emerita* Aud. & M.-Edw.: *h*, head; *i*, chevrons; *k*, jaw ×20 (after Ehlers); *l*, paragnaths ×47; *m*, 50th foot ×47; *n*, 140th foot ×31; *p*, *q*, stalks of compound bristles, front and side view, ×272.

(?) *Goniada australensis* Quatrefages, Augener, 1927a, p. 197, fig. 9.
(?) *Goniada japonica,* Izuka, 1912, p. 238, pl. XXIII, figs. 1–6.
(?) *Goniada longicirrata,* Monro, 1937, p. 285.

The prostomium has nine rings, of which the basal ones are larger than the others. 60–70 anterior feet uniramous, with a dorsal cirrus, a setigerous process with three ligules, a thick short ventral cirrus, an aciculum and a bundle of compound setae. The suceeding parapodia biramous; dorsal ramus with a conical cirrus, foliaceous in the posterior segments, a blunt setigerous process with an aciculum and 2–3 straight, stout, blunt acicular bristles; ventral ramus with a posterior and two anterior tapering ligules, a stout ventral cirrus and a bundle of compound spinigerous setae. In the posterior region both rami are widely apart. 6–12 V-shaped paragnaths (chevrons) on each side of the proboscis, which is armed with two large, toothed, horny jaws and 25–55 X-shaped paragnaths in a nearly continuous belt.

Length: 35–350 mm.

Colour: In spirit brownish especially in the posterior part.

Occurrence: Vizagapatam; Vandrutti, Cochin State.

Distribution: Japan?, Australia?, India; Atlantic Ocean, Mediterranean Sea.

276. **Goniada annulata** Moore. (Fig. 145, *a–h*).

Goniada annulata, Moore, 1905, p. 549, pl. XXXVI, figs. 45–48: Fauvel, 1932, p. 121, pl. III, figs. 9–16.
(?) *Goniada echinulata,* Grube, 1869, p. 39.

Body divided into anterior cylindrical and posterior somewhat flattened regions. Prostomium conical, indistinctly annulate. Eyes absent (?) Proboscis thickly covered with pointed, hooked, papillae. Two horny jaws with a large hook and 3–4 smaller teeth; 5–6 double, X-shaped, ventral paragnaths and about 15 smaller ones. About 20 V-shaped chevrons on each side of the base of the proboscis. Anterior region of 48 segments, of which 27 are uniramous and the succeeding 21 already provided with capillary dorsal setae. Dorsal cirrus heart-shaped, foliaceous, pedunculate. Setigerous lobe with three conical tapering ligules; a thick ventral cirrus, an aciculum and compound heterogomph spinigers. A small dorsal ramus with two unequal ligules, an aciculum and 5–6 very slender capillary setae are gradually developed from the 28th foot backwards. In the posterior region the dor-

sal ramus consists of a large heart-shaped foliaceous dorsal cirrus, a short setigerous lobe with an aciculum, *two conical ligules* and a bundle of slender simple capillary setae: ventral ramus with three triangular, subequal ligules, an

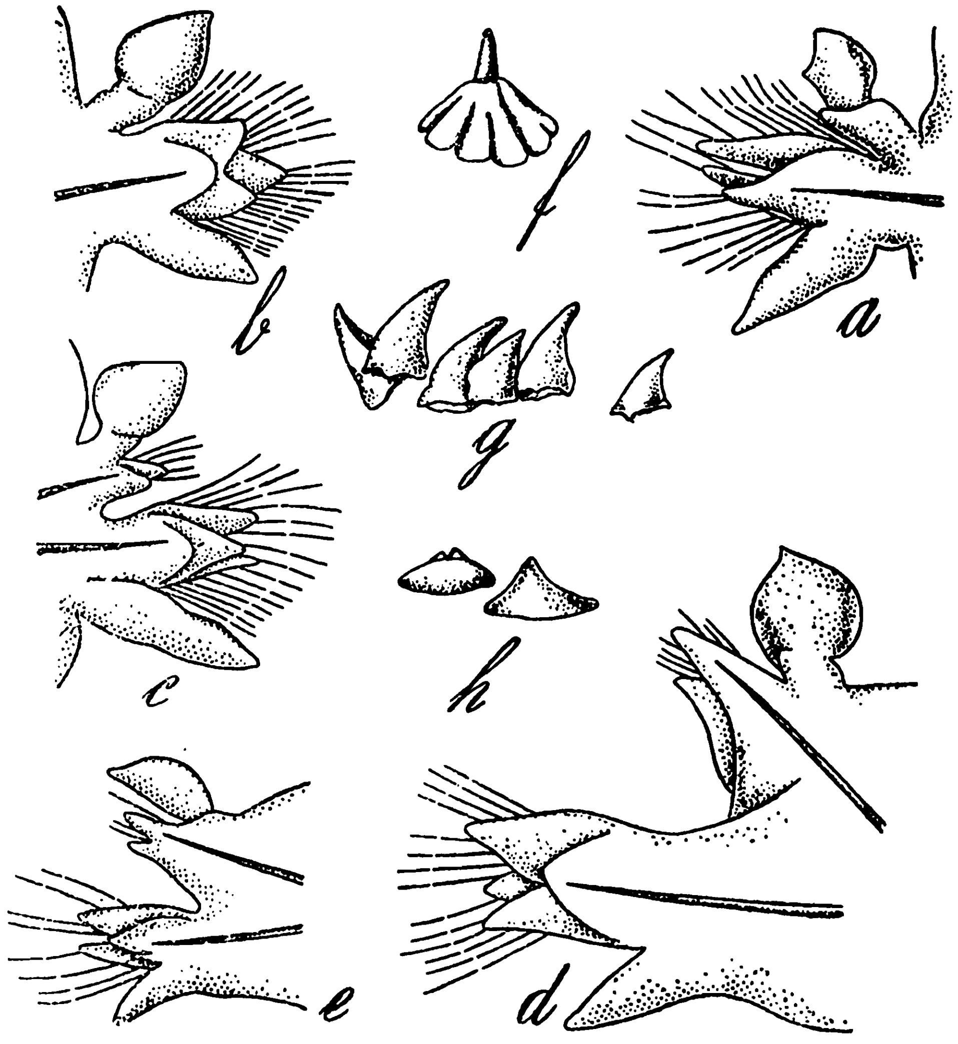


Fig. 145.—*Goniada annulata* Moore: *a*, 8th foot ×50; *b*, 19th foot ×50; *c*, 39th foot ×50; *d*, 97th foot ×50; *e*, 112th foot ×50; *f*, dorsal papilla ×88; *g*, hooked papillae ×88; *h*, ventral papillae ×88.

aciculum and a bundle of compound spinigerous setae, and a conical ventral cirrus. The papillae of the proboscis are very peculiar, inserted on a low conical lobed base.

Length: 50 mm. by 2–3 mm.

Colour: In spirit whitish, with rusty brown specks.

Occurrence: South of Ceylon, 660 fms.

Distribution: Gulf of Georgia; North Pacific Ocean; Ceylon.

277. Goniada eximia Ehlers. (Fig. 147, *e, f*).

Goniada eximia, Ehlers, 1901, p. 157, pl. XX, figs. 7–17: Monro, 1936, p. 141, fig. 25, *a–j*; 1937, p. 285.

Body divided into two regions. Prostomium very small, blunt, eyeless. Prosboscis densely covered with small kidney-shaped papillae. Two large jaws, each with five teeth, a circle of about 22 small X-shaped paragnaths and a second row of smaller ones; 18 pairs of chevrons in the young, *absent in the adult*. Anterior region with 58–59 uniramous feet and the change to biramous is complete about the 96th foot. Anterior feet with a large, flattened, dorsal cirrus, a setigerous lobe with two digitiform ligules and a third, triangular, behind, and a large ventral cirrus, an aciculum and compound heterogomph spinigers. In the posterior region, the dorsal ramus consists of a broad, flattened, dorsal cirrus, a triangular dorsal ligule, of about the same size, an aciculum and a bundle of simple capillary bristles, almost entirely enclosed. In the ventral ramus, the two anterior lips are fused proximally, only their pointed ends remain free and the posterior lip is a *broad flattened structure resembling a tennis racket* in shape with a triangular process at the apex. A broad flattened ventral cirrus. Compound heterogomph falcigers.

Length: 250–760 mm. by 4–13 mm.

Colour: In spirit yellowish-green.

Occurrence: North Arabian Sea, 1519–1705 m.

Distribution: Magellan; Falkland Islands; Arabian Sea.

Sub-genus GONIADOPSIS Fauvel.

V-shaped paragnaths absent on the sides of the proboscis. Body divided into three regions: (1) an anterior, with uniramous parapodia, short cirri and stout falcigerous setae; (2) intermediate, with uniramous parapodia, long cirri and spinigerous setae and (3) a posterior, with biramous parapodia, dorsal acicular setae and long spinigerous ventral setae.

Key to the species of the sub-genus Goniadopsis.

Posterior ventral rami bilobed	*incerta* Fauvel, p. 286.
Posterior ventral rami trilobed	*agnesiae* Fauvel, p. 287.

278. Goniada (Goniadopsis) incerta Fauvel. (Fig. 146, *a—k*).

Goniada (Goniadopsis) incerta, Fauvel, 1932, p. 122, pl. IV, fig. 1—10.

Anterior and intermediate regions narrowly cylindrical, posterior region broader. Prostomium sharp conical, ringed, with four small tentacles at the tip, and two very small black, widely separated, eyes at the base. Proboscis cylindrical and apparently smooth, but covered with very minute globular papillae. No V-shaped chevrons. An-

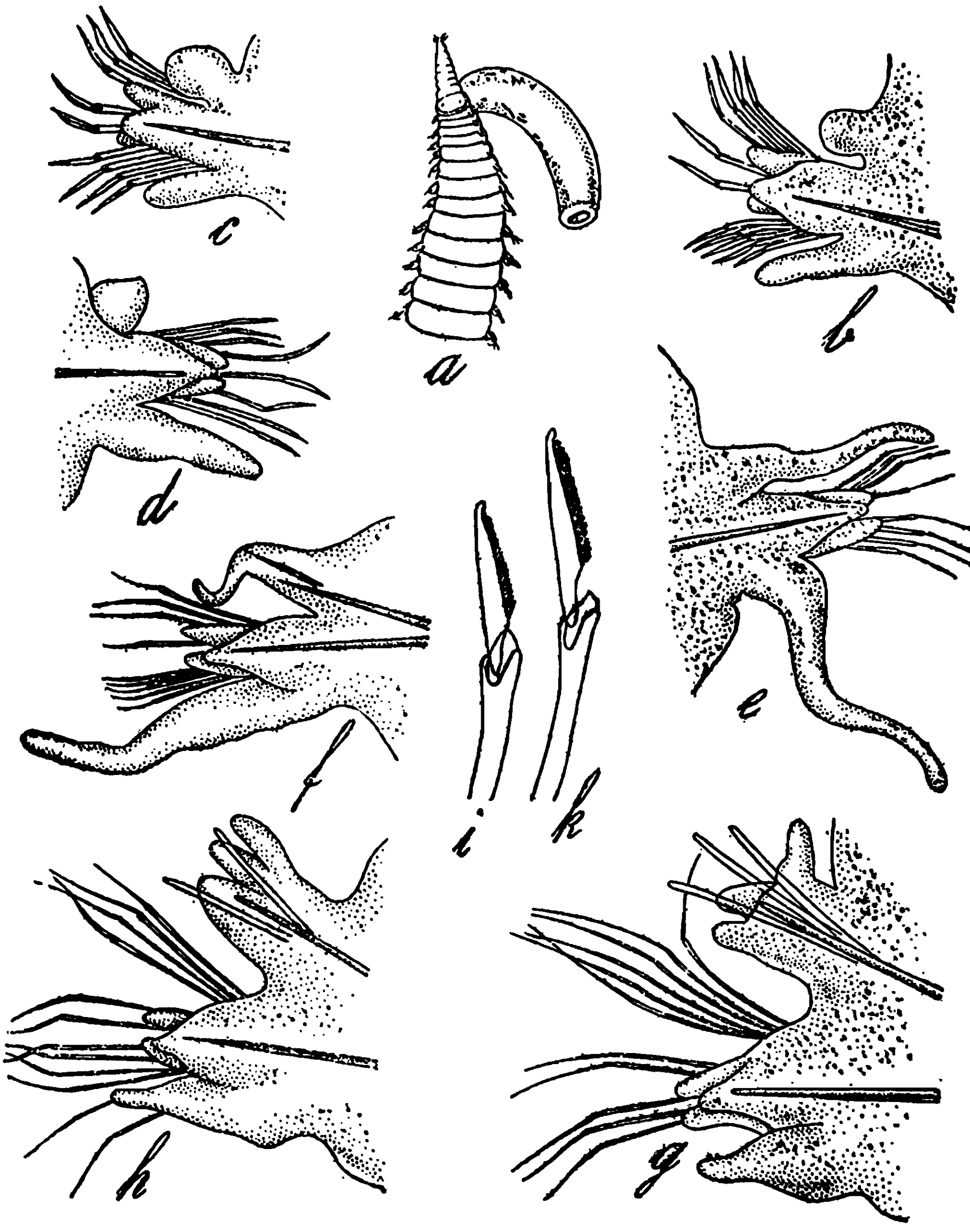


Fig. 146.—*Goniada (Goniadopsis) incerta* Fauvel: *a,* anterior end, dorsal view, enlarged; *b* and *c,* two anterior feet ×50; *d,* anterior foot with long ventral cirrus ×50; *e,* 37th foot, intermediate region ×60; *f,* one of the first feet with dorsal bristles (about 50th) ×50; *g,* foot of the enlarged biramous region ×50; *h,* posterior foot ×50; *i,* and *k,* compound bristles from anterior region ×225.

terior region of 23–24 setigerous segments, with uniramous parapodia, including a broad, short, foliaceous dorsal cirrus, a setigerous process with three ligules, one posterior and broadly triangular and two anterior finger-shaped and sub-equal, a thick short club-shaped ventral, cirrus, an aciculum and two bundles of stout compound setae, with a short, rather broad, ciliate end-piece. Middle region of about 30 segments, with uniramous parapodia including a long finger-shaped dorsal cirrus, a setigerous process with three ligules, one posterior triangular and two anterior slightly longer; a ventral cirrus twice or thrice as long, an aciculum and two bundles of more slender compound setae, with a long tapering delicately spinose terminal piece. Posterior region with conspicuously biramous feet including, in the dorsal ramus, a short cirrus, a bilobed setigerous process, with an aciculum and 2–3 short acicular setae, blunt at the tip; in the ventral ramus, a triangular posterior ligule, two anterior, slightly longer, finger-shaped ligules, a large blunt conical ventral cirrus, an aciculum and two bundles of compound spinigerous setae like those of the middle region.

Length: 50 mm. by 1.5–2 mm. The single specimen is a female with eggs.

Occurrence: Off Akyab, Burma, 530 fms.

279. **Goniada (Goniadopsis) agnesiae** Fauvel. (Fig. 144 *a–f*)

Goniada (*Goniadopsis*) *agnesiae*, Fauvel, 1930, p. 32, fig. 7, *a–f*.

Body divided into three regions: the anterior and middle ones slender, cylindrical, and the posterior one somewhat broader and more flattened. 150 segments and more. Prostomium elongated, tapering conical, ringed, with four slender tentacles at the tip and two small black, widely separated, eyes at the base. Proboscis cylindrical, armed with two large pectinate jaws, four bi-dentate paragnaths between the jaws and, on the other side, a semicircular row of about twelve smaller bi-dentate denticles apparently simple. There are no V-shape chevrons. Anterior region of about 28 segments, with uniramous parapodia including a broad, short, lanceolate dorsal cirrus, a setigerous process with three ligules, one posterior broadly triangular, and two anterior finger-shaped, unequal, a short ventral cirrus, an aciculum and a bundle of stout compound setae with a short blunt, slightly bent, end-piece. Middle region of 39 segments, with uniramous parapodia including a finger-shaped dorsal cirrus,

two ligules, one short, triangular, the other longer, finger-shaped; a ventral cirrus, twice or thrice as long, an aciculum and two bundles of compound setae, thinner than the former, with long, narrow, delicately spinose end-piece. Posterior region with biramous parapodia including, in the dorsal ramus, a short conical cirrus, a blunt setigerous process with an aciculum and two short acicular setae, blunt at the tip; in the ventral ramus, a triangular posterior ligule, an anterior one longer and finger-shaped, a short, thick, ventral cirrus, an aciculum and two bundles of compound spinigerous setae, with a long terminal piece, like those of the middle region.

Length: 105 mm. by 1 mm.

Colour: Bright-red in front, pale ochraceous behind. In the posterior region only, a ventral spot in the middle of each segment.

Occurrence: Gulf of Mannar, Krusadai Island; in sand; a single specimen, incomplete behind.

Genus GLYCINDE Müller.

Syn. *Eone* Malmgren

Body divided into two regions. Proboscis beset with papillae. Two big horny jaws and numerous paragnaths. Lateral V-shaped paragnaths (chevrons) absent. Anterior parapodia uniramous; posterior parapodia biramous. Branchiae absent. Dorsal setae acicular, ventral setae compound.

280. **Glycinde oligodon** Southern. (Fig. 147, *a–d*).

Glycinde oligodon, Southern, 1921, p. 629, pl. XXVIII, fig. 18: Fauvel, 1932, p. 123.

Anterior part of the body rounded, middle and posterior regions flat. Prostomium with a basal ocular segment and eight rings. Four small tentacles. Proboscis nearly square in section, with two dorsal bands, each of four irregular rows of transparent, horny, hooked papillae and two ventral bands of smaller soft mammillate papillae. Two large ventral jaws and a dorsal row of 4–5 small denticles. Anterior feet uniramous, with a large, broad, blunt, dorsal cirrus indented near the tip, a rounded setigerous lobe and a longer ligule, and a blunt, thick, conical ventral cirrus; compound spinigerous bristles. Middle and posterior feet biramous, a dorsal cirrus with a short, stout, swollen base, a dark spine accompanied by two or three dark brown setae having a curved tip, and a long,

slender, curved, spine on the crest; a small rounded papilla. Ventral ramus as in the anterior feet, except that the posterior lobe is rather longer and wider.

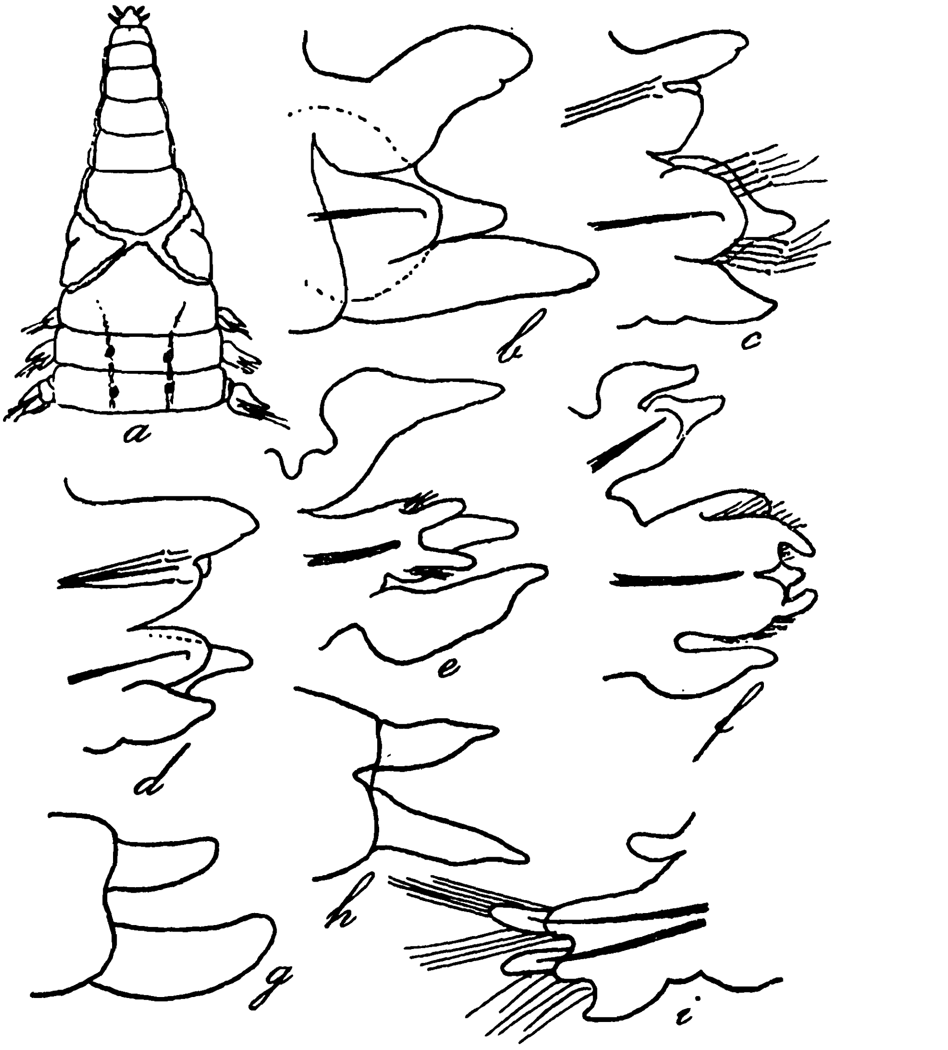


Fig. 147.—*Glycinde oligodon* Southern: *a*, anterior end, ventral view ×78; *b*, 10th right foot, posterior view, setae omitted ×272; *c*, 30th foot ×117; *d*, 90th foot ×117 (after Southern). *Goniada eximia* Ehlers: *e*, 45th foot; *f*, foot from middle region, front view (after Monro). *Glycera lancadivae* Schmarda: *g*, *h*, parapodial ligules (after Willey). *Gl. sagittariae* McIntosh: *i*, 30th foot ×31 (after McIntosh).

Length: 20 mm. 97 segments.

Colour: The body dark greenish-yellow.

Occurrence: Chilka Lake, on muddy bottom; off Santapalli, Vizagapatam, Bay of Bengal, 840 fms.

Sub-family *GLYCERINAE*.

Body not divided into regions. Proboscis with only four horny jaws. Gills present or absent.

Key to the genera of GLYCERINAE.

Parapodia uniramous. Gills absent ..	*Hemipodus* (1)
Parapodia biramous; gills present or absent, often retractile	*Glycera* Savigny, p. 290.

Genus GLYCERA Savigny.

Body rounded, tapering at both extremities; segments two or three-ringed. Prostomium acutely conical, ringed, with four small terminal tentacles. Proboscis club-like, with four hooked horny jaws. Parapodia biramous, with a stumpy dorsal cirrus, two anterior lobes, one or two posterior lobes, a ventral cirrus. Branchiae present or absent, simple or branched, permanent or retractile into the foot. Ventral setae compound, spinigerous; dorsal setae simple, capillary.

Key to the species of Glycera.

1. Branchiae absent ..	2
Branchiae present ..	3
2. A single posterior lobe in the feet	*lancadivae* Schmarda, p. 291.
Two rounded posterior lobes	*tesselata* Grube, p. 291.
3. Branchiae simple	5
Branchiae branched ..	4 ..
4. Branchiae bifid	*manorae* Fauvel, p. 298.
Branchiae multifid	*cirrata* Grube, p. 297.
5. Branchiae permanent ..	6
Branchiae retractile ..	9
6. A single posterior lobe in the feet	*longipinnis* Grube, p. 291.
Two posterior lobes in the feet	7
7. Posterior lobes unequal ..	*alba* Rathke, p. 292.
Posterior lobes equal ..	8
8. Posterior lobes short, blunt ..	*sagittariae* McIntosh, p. 295.
Posterior lobes pointed ..	*prashadi* Fauvel, p. 294.
9. Branchiae rounded, vesicular. Posterior lobes equal, rounded	*gigantea* Quatrefages, p. 296.
Branchiae cirriform. Posterior lobes unequal ..	*rouxii* Aud. & M.-Edw., p. 297.

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(1) Not yet recorded from India.

281. Glycera tesselata Grube. (Fig. 152, *a—c*).

Glycera tesselata, Fauvel, 1923a, p. 387, fig. 152; 1932, p. 124.

Branchiae absent. Parapodia with two anterior equal elongated lobes and two posterior lobes much shorter, rounded and equal to each other. Papillae of the proboscis long and slender. Supports of the jaws (ailerons) with two long dagger-like processes.

Length: 15—35 mm.

Colour: White spots on pink ground, in life. In spirit, brown with tesselated pattern.

Occurrence: Andaman Islands; Doarakara, Sunderbans; off Puri, Orissa; Hulule and Heratera Islands, Addu atoll, Maldive Archipelago.

Distribution: Pacific, Indian and Atlantic Oceans.

282. Glycera lancadivae Schmarda. (Fig. 147, *g, h*)

Glycera lancadivae, Schmarda, 1861: Michaelsen, 1892, p. 12: Willey, 1905, p. 286, pl. VI, figs. 113—116; Fauvel, 1930b, p. 540; 1932, p. 125: Monro, 1937, p. 184.

Branchiae absent. Parapodia with two anterior, equal, elongated lobes and a single posterior, rounded, slightly emarginate lobe. Papillae of the proboscis of two kinds, acuminate, and rounded, destitute of terminal nail-like appendage. Supports of the jaws (ailerons) with short unequal processes.

Length: 40—60 mm. and more.

Occurrence: Burma; Madras Coast; Ceylon; Laccadive and Maldive Archipelagoes.

Distribution: Burma, Ceylon, Laccadive and Maldive Archipelagoes, Persian Gulf.

282. Glycera longipinnis Grube. (Fig. 148, *a—d*).

Glycera longipinnis, Grube, 1878, p. 182, pl. VIII, fig. 9: Fauvel, 1932, p. 125, pl. IV, figs. 11—14.

Branchiae simple, large, inserted on the dorsal edge of the foot. Parapodia elongated, with two anterior subequal, cirriform lobes, and a single posterior, rounded or faintly emarginate, lobe. Papillae of the proboscis long, cylindrical, destitute of terminal nail-like appendage.

Supports of the jaws (ailerons) with two long dagger-like processes.

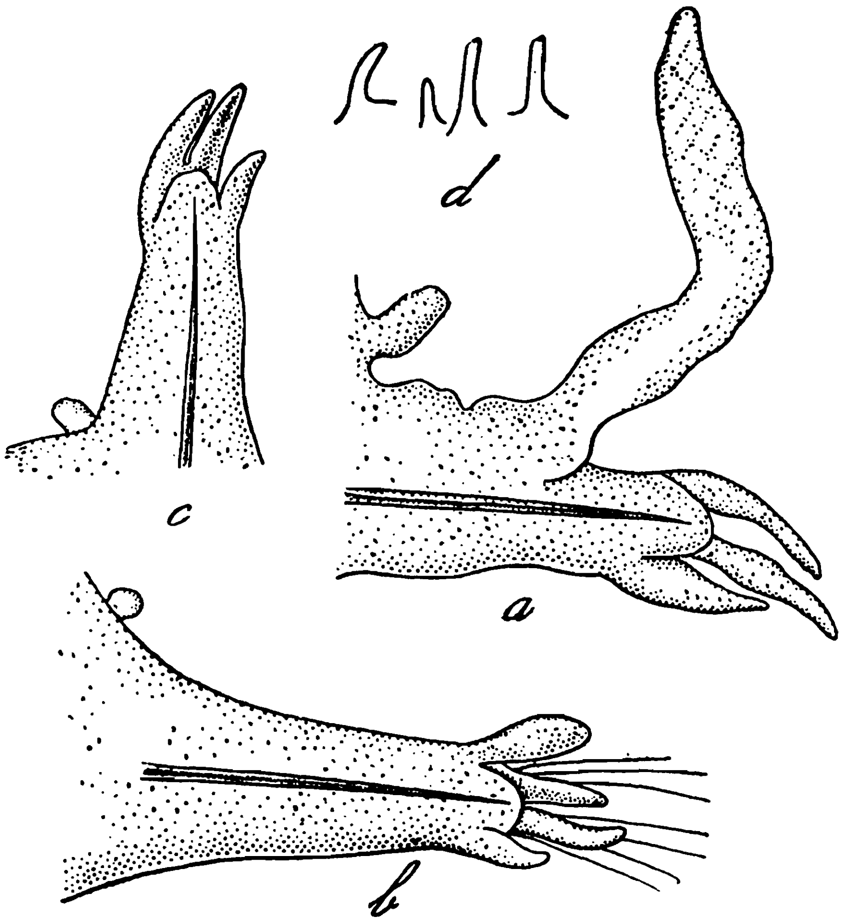

Fig. 148.—*Glycera longipinnis* Grube: *a,* foot of specimen from Sta. 168, with large gills ×35 ; *b,* branchiate foot of specimen from Sta. 292×35; *c,* abranchiate foot of the same specimen ×35; *d,* papillae of the proboscis ×117.

Length: 100 mm. by 2—3 mm.

Colour: Flesh-brown.

Occurrence: Bay of Bengal.

Distribution: Philippine Islands; Bay of Bengal, Persian Gulf.

284. Glycera alba Rathke. (Fig. 149, *i—m*).

Glycera alba, Fauvel, 1923a, p. 385, fig. 150 (Synonymy); 1932, p. 126: Gravely, 1927, p. 9.

Glycera alba var. *cochinensis,* Southern, 1921, p. 627, pl. XXVII, fig. 17.

(??) *Glycera cinnamomea,* Grube, 1874, p. 327.

Branchiae simple, inserted on the dorsal edge of the foot. Parapodia with two anterior, subequal, triangular or cirriform lobes and two posterior lobes, the upper one

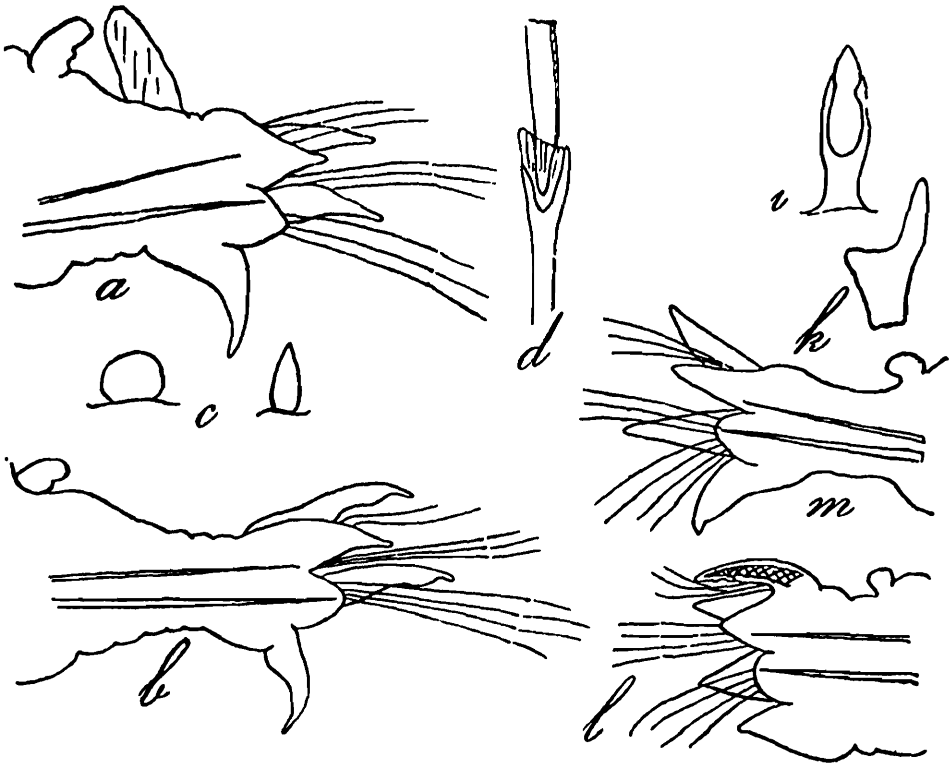

Fig. 149.—*Glycera rouxii* Aud. & M.-Edw.: *a,* foot from mid-body, posterior view ×15; *b,* hind foot ×23; *c,* papillae, *d,* compound seta ×270. *Glycera alba* Rathke: *i,* papillae ×190; *k,* jaw's wing ×23; *l,* foot from mid-body ×31; *m,* hind foot ×31.

triangular, shorter than the anterior, the lower rounded and still shorter. Papillae of the proboscis obliquely truncated (unguiculate), with a transparent nail-like appendage. Supports of the jaws triangular, with a single process.

Length: 60—100 mm. by 3 mm.

Colour: Milk-white in life, yellowish in spirit.

Remarks: The variety *cochinensis* differs from the type only in possessing longer branchiae and more acute lobes of the feet.

Occurrence: Ganjam Coast; Cochin Backwater; Mormugao Bay.

Distribution: Indian Ocean, India, Red Sea; Atlantic Ocean.

285. Glycera prashadi Fauvel. (Fig. 150, *a–h*).

Glycera prashadi, Fauvel, 1932, p. 126, pl. V, figs. 1–8.

Body tapering posteriorly, segments bi-annulate, Prostomium acutely conical, faintly ringed, with four very small filiform tentacles. Proboscis long, cylindrical, covered with minute cylindrical unguiculate papillae, obliquely truncated, with a kind of transparent chitinous nail at the tip. Supports (ailerons) of the jaws triangu-

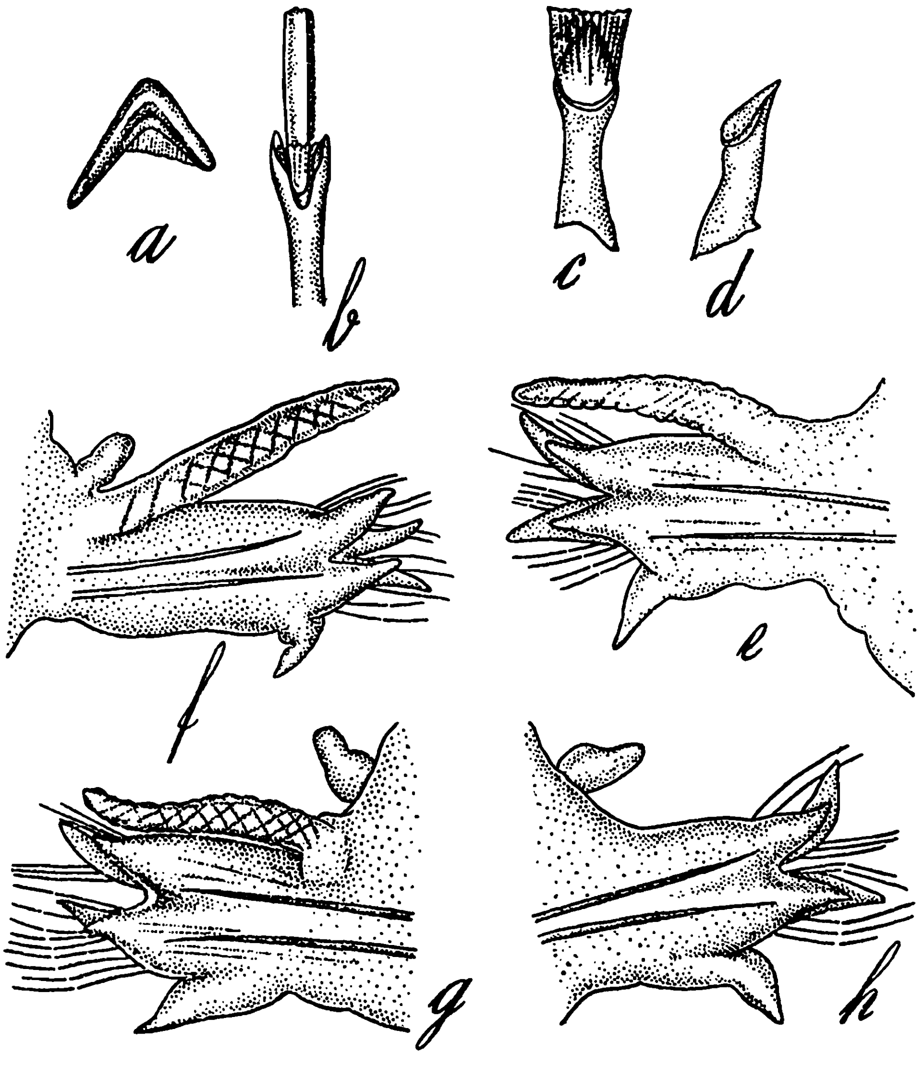

Fig. 150.—*Glycera prashadi* Fauvel: *a*, support of the jaw (aileron), enlarged; *b*, joint of compound bristle ×290; *c* and *d*, papillae of the proboscis, front and side view ×290; *e*, foot from mid-body ×26; *f*, posterior foot ×26; *g*, foot from mid-body ×26; *h*, anterior abranchiate foot ×26.

lar, with unequal, rather long, diverging processes. Parapodia with two equal anterior long, acutely conical, lobes and two equal posterior triangular lobes, but shorter than the anterior ones. Dorsal cirrus globular, knob-like, near the base of the foot. Ventral cirrus triangular, shorter than the posterior lobes. A bundle of simple

dorsal setae. Two bundles of ventral compound homogomph bristles with a long terminal piece, winged and finely serrated. Posterior feet more elongated and slender.

Length: 8—10 mm. by 3—4 mm. feet included.

Colour: Discoloured in spirit.

Occurrence: Burma Coast, Mergui; Nankauri, Nicobar Islands; Bay of Bengal; Persian Gulf.

286. **Glycera sagittariae** McIntosh. (Fig. 147, *i*; Fig. 151, *a—d*)

Glycera sagittariae, McIntosh, 1885, p. 346, pl. XLII, fig. 8, pl. XXIIA, fig. 10: Treadwell, 1903, p. 1174: Fauvel, 1932, p. 127, fig. 17.

Branchiae simple, short, inserted on the dorsal edge of the feet. Parapodia with two equal anterior, elongated, tapering lobes, and two equal posterior blunt triangular lobes, but much shorter than the anterior ones. Dorsal cirrus more or less remote. Papillae of the proboscis of two kinds: short globular or ovate, and long

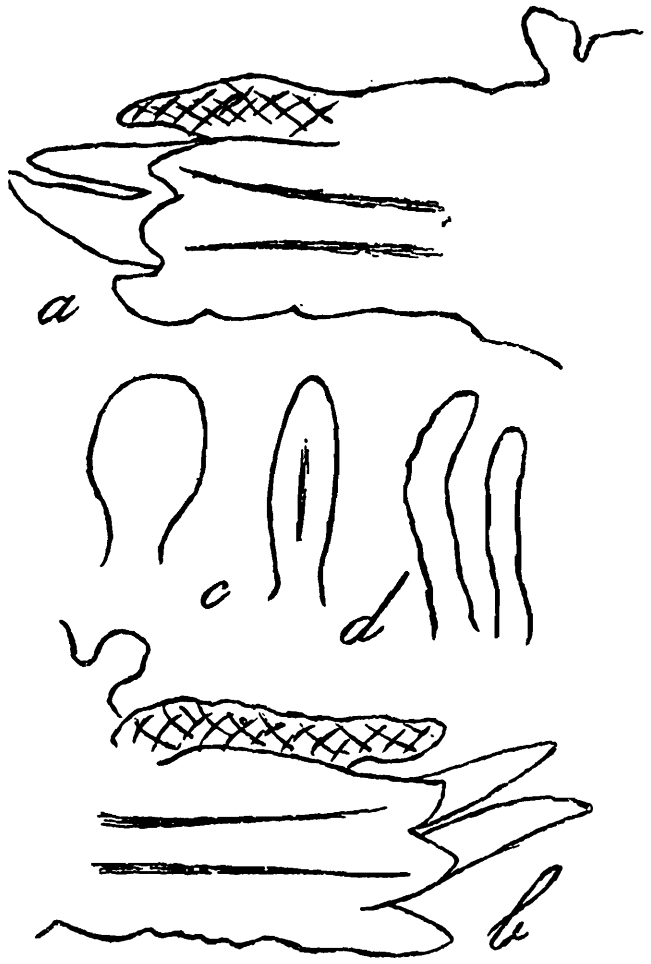

Fig. 151.—*Glycera sagittariae* McIntosh: *a*, *b*, feet, setae omitted ×65; *c*, *d*, globular and elongated papillae ×150.

slender, without terminal nail-like appendage. Supports of the jaws (ailerons) with two long dagger-like processes. Only an anterior fragment. Might be described as a branchiate *Gl. tesselata* Grube.

Occurrence: Seven Pagodas, Madras Coast.

Distribution: Hawaii; Aru Islands; Madras Coast.

287. **Glycera gigantea** Quatrefages. (Fig. 152, *d–k*)

Glycera gigantea, Fauvel, 1923a, p. 387, fig. 152, *d–k* (Synonymy); 1932, p. 128: Monro, 1931, p. 18.

Glycera siphonostoma D. Ch., Augener, 1927, p. 138.

Branchiae simple, rounded, vesicular, retractile into the anterior side of the feet. Parapodia with two anterior, digitiform equal lobes and two very short, rounded,

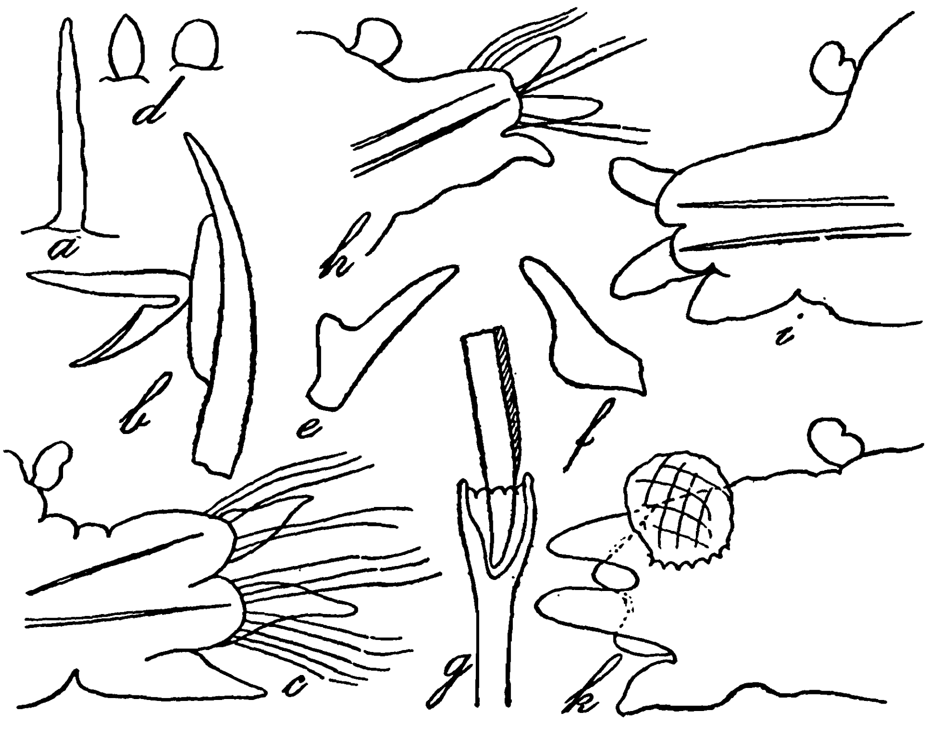

Fig. 152.—*Glycera tesselata* Grube: *a*, proboscis papillae ×117; *b*, jaw ×73; *c*, foot from mid-body ×39. *Glycera gigantea* Quatrefages: *d*, proboscis papillae ×117; *e*, *f*, jaw's wings ×23; *g*, compound bristle ×190; *h*, foot from young stage ×31; *i*, *k*, foot from mid-body, front and back view, setae omitted ×15.

slightly unequal lobes. Papillae of the proboscis of two kinds: a few globular and others elongated, destitute of terminal nail-like appendage. Supports of the jaws triangular, with a long process on one side.

Length: 200–350 mm.

Colour: Pink anteriorly, grey behind, in life. Yellowish or copperish, in spirit.

Occurrence: Laccadive Sea, 430 fathoms.

Distribution: New Pomerania; Great Barrier Reef; Laccadive Sea; Atlantic Ocean, Mediterranean Sea.

288. **Glycera rouxii** Audouin and Milne-Edwards. (Fig. 149, *a–d*).

Glycera rouxii, Fauvel, 1923a, p. 389, fig. 153, *a–c;* 1932, p. 128: Monro, 1937, p. 284.

Glycera goesi, Malmgren, 1867, p. 184, pl. XV, fig. 81; Arwidsson, 1898, p. 22, pl. I, figs. 13–14: Izuka, 1912, p. 238, pl. XXIV, fig. 1–2.

Glycera decipiens, Marenzeller, 1879, p. 140, pl. VI, fig. 3.

(?) *Glycera nicobarica*, Grube, 1867, p. 24, pl. III, fig. 1.

Branchiae simple, slender, retractile into the anterior side of the feet. Parapodia with two equal anterior pointed lobes and two posterior sub-equal shorter, broader, lobes. In the posterior feet, the posterior upper lobe is pointed and the inferior lobe is much shorter and blunt. Papillae of the proboscis either globular or lanceolate, conical, destitute of terminal nail-like appendage. Supports of the jaws triangular, with a long process on one side. The branchiae being retractile, in preserved specimens very often only a few, or none, are exserted, the animal then appearing as quite abranchiate.

Length: 100–200 mm.

Colour: Yellowish-brown, in spirit, with, often, feet darker.

Occurrence: Andaman Islands; Chandipore, Orrisa Coast; Vizagapatam; Gulf of Mannar; Pamban Backwater; Laccadive Sea.

Distribution: California; Japan; Andaman Islands, India, Persian Gulf; Atlantic Ocean, Mediterranean Sea.

289. **Glycera cirrata** Grube. (Fig. 153, *a–e*)

Glycera cirrata, Grube, 1869b, p. 35: Fauvel, 1932, p. 129, fig. 18.

Body large, tapering and very slender posteriorly, numerous bi-annulate segments. Prostomium acutely conical, with 11-12 faintly bi-annulate rings and four small terminal tentacles. Parapodia with two anterior long, sharp, equal lobes and two posterior similar, but shorter, equal lobes. Dorsal cirrus an ovoid knob, inserted near the base of the foot. Ventral cirrus sharp, triangular, about the same length as the posterior lobes. Branchiae retractile, beginning from about the 17th to the 25th–

30th foot, first simple, long, cirriform, then bifurcate, and next divided into 3, 4 or 5 branches; in the posterior segments they are again simple. They are inserted at the base of the foot, near the dorsal cirrus, on the posterior

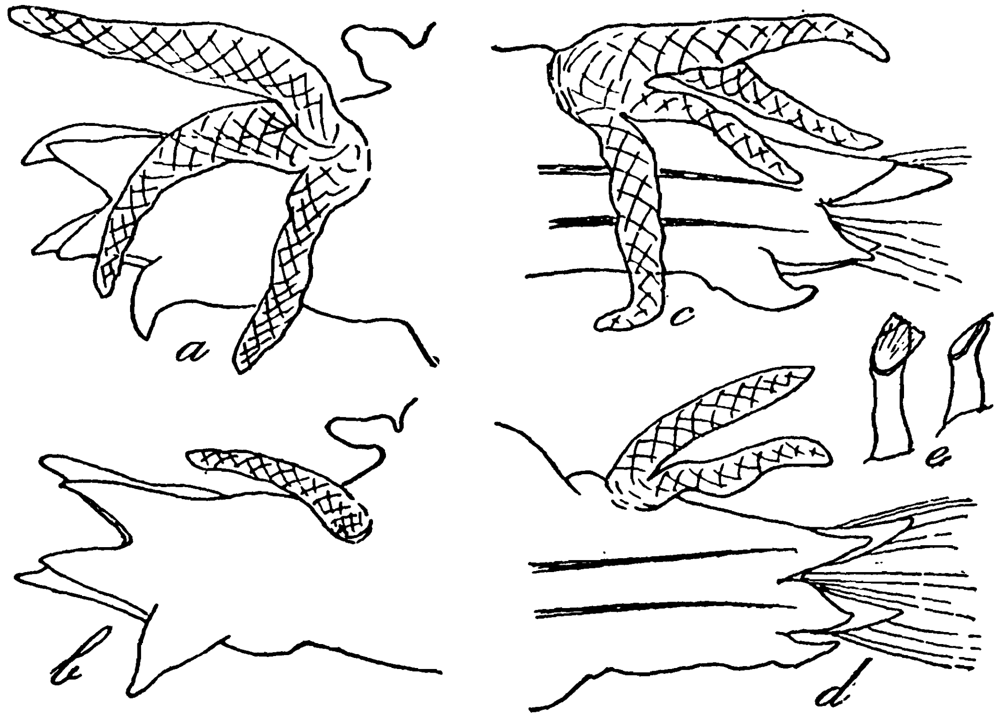

Fig. 153.—*Glycera cirrata* Grube: *a, b,* anterior feet, setae omitted ×34; *c,* foot from mid-body ×34; *d,* posterior foot ×34; *e,* unguiculate papillae ×110.

side of the upper border of the dorsal ramus. Proboscis long, club-like, beset with cylindrical unguiculate papillae obliquely truncated, with a transparent nail-like appendage at the tip. Supports of the jaws (ailerons) triangular, with an elongated process on one side.

Length: 10—15 mm. by 5 mm., feet included.

Colour: Yellowish in spirit.

Occurrence: Burma, Andaman Islands, Madras Coast.

Distribution: Burma, Andaman Islands, India, Persian Gulf, Red Sea; Brazil.

290. Glycera manorae Fauvel. (Fig. 154, *a—i*)

Glycera manorae, Fauvel, 1932, p. 130, pl. V, figs. 9—17.

Body rather large, tapering posteriorly; segments numerous, bi-annulate. Prostomium acutely conical, with 10—12 rings and four small terminal tentacles. Parapodia with two anterior sharp triangular, mucronate, equal lobes and two posterior nearly equal, similar, but shorter

and more blunt lobes. Dorsal cirrus an elongated knob inserted near the base of the foot. Ventral cirrus triangular, about the same length as the posterior lobes. Posterior feet more slender and elongated. Branchiae retractile, beginning about the 17th foot, first simple, large, digitiform; those following divided into two long, more or less equal, branches. In the posterior feet, they are again simple. They are inserted at the base of the foot on its upper border, or slightly behind, near the dorsal cirrus. On a number of feet, one or two small retractile vesicular

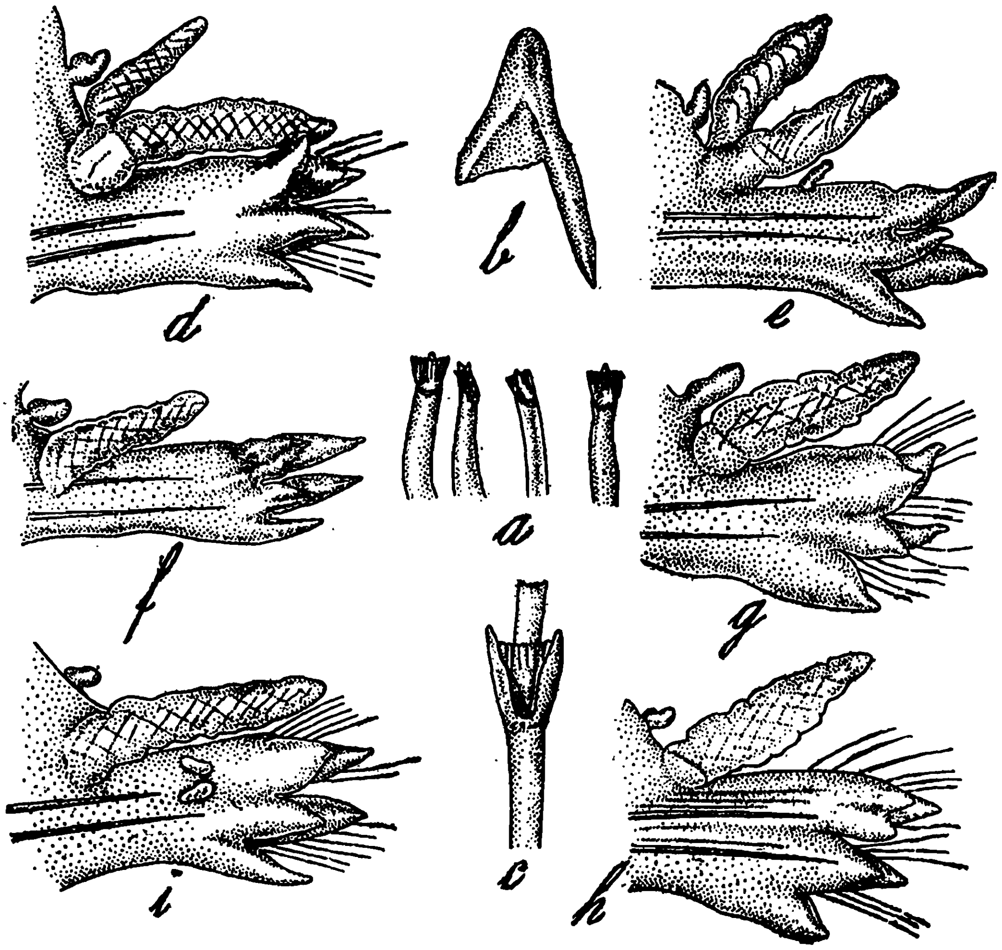

Fig. 154.—*Glycera manorae* Fauvel: *a*, papillae of the proboscis ×98; *b*, support of the jaw (aileron) ×21; *c*, joint of compound bristle ×233; *d*, foot from mid-body with bifid gill ×21; *e*, foot with small accessory gill ×21; *f*, posterior foot with simple gill ×21; *g*, anterior foot with large simple gill ×21; *h*, anterior foot with posterior dorsal ligule bilobed ×21; *i*, foot from mid-body with two small accessory gills ×21.

gills, of a more or less elongated knob-like shape, are inserted on the posterior side of the foot, slightly behind the superior lobe. Proboscis covered with small cylindrical unguiculate papillae, obliquely truncated, with a transparent nail-like appendage at the tip. Supports of the jaws (aileron) triangular with an elongated process on

one side. Dorsal setae capillary, with a narrow wing; they are grouped in two bundles. Ventral setae homogomph, compound, or hemigomph with a long, slender, finely serrated terminal piece.

Length: About 70 mm. by 5 mm., feet included.

Colour: In spirit, rusty yellow, pedal lobes very dark at the tip.

Occurrence: Manora Shoal, Karachi.

SEDENTARIA.

Family ARICIIDAE Aud. & M.-Edw.

Body vermiform, segments numerous, divided into two regions: (1) thorax more or less enlarged, depressed, and (2) abdomen much longer and somewhat cylindrical. Prostomium conical, cylindrical or globular, without any appendages. Proboscis unarmed. Feet biramous, with acicula. Gills dorsal, generally simple, ciliate. A dorsal cirrus. The ventral rami of the thorax are flattened pads with, or without, a fringe of papillae and vertical rows of stout bristles. In the abdomen, the ramus is bilobed, erect, with, or without, a ventral cirrus. Sometimes an intermediate cirrus between the two rami. Often transverse rows of papillae on the ventral side of a number of anterior segments. Setae simple, of many kinds. Lateral sense-organs, and dorsal sense-organs. One pair of erect, lanceolate, gills on each segment.

Key to the genera of ARICIIDAE.

1. Prostomium sharp pointed ..	2
Prostomium rounded	*Nainereis* Blainville, p. 310.
2. Thoracic ventral rami with vertical rows of foot papillae	*Aricia* Savigny, p. 300.
Thoracic ventral rami without vertical rows of foot papillae	*Scoloplos* Blainville, p. 306.

Genus ARICIA Savigny.

Prostomium conical. A pair of erect lanceolate gills on each segment, except on a few anterior ones. Thoracic feet with an erect dorsal cirrus and a bundle of serrated capillary setae. Ventral ramus pad-like, with vertical rows of stout bristles and foot papillae. Often transverse ventral rows of papillae on a few segments. In the abdomen, an erect dorsal cirrus, capillary setae and forked setae, sometimes an intermediate cirrus. Ventral ramus

bilobed, with capillary setae and a ventral cirrus. Dorsal sense-organs anchor-shaped.

Key to the species of Aricia.

1. Large hastate (spear-like) spines on a few thoracic segments	*nuda* Moore, p. 303.
No such spines	2
2. Intermediate cirrus present	*cuvieri* Aud. & M.-Edw., p. 301.
Intermediate cirrus absent ..	*exarmata* Fauvel, p. 304.

291. Aricia cuvieri Aud. & M.-Edw. (Fig. 155, 156)

Aricia cuvieri, Fauvel, 1927a, p. 12, fig. 3 *e—l*. (Synonymy); 1932, p. 161.

Aricia cuvieri var. *perpapillata*, Eisig, 1914, p. 334, pl. XI, fig. 10; pl. XV, fig. 18—20; pl. XVIII, figs. 1—14.

Prostomium sharp conical, without eyes. 22—24 thoracic segments, with a fringe of 10—15 sharp conical

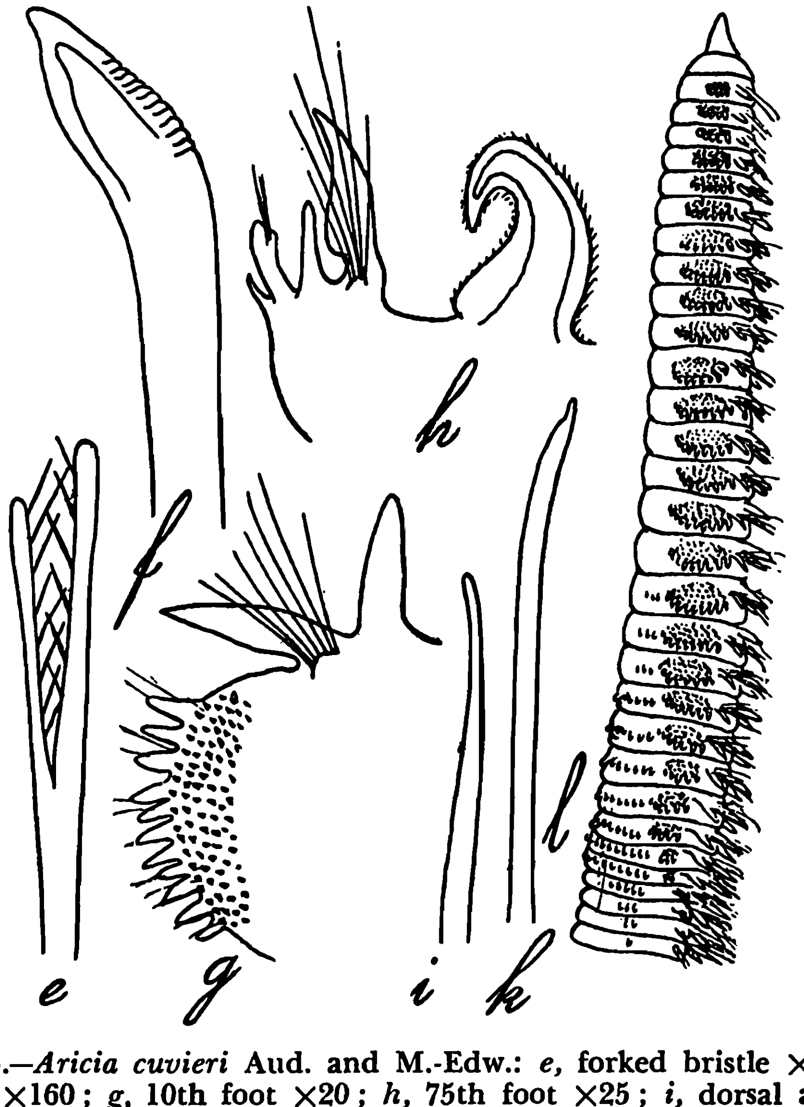

Fig. 155.—*Aricia cuvieri* Aud. and M.-Edw.: *e*, forked bristle ×400; *f*, hook ×160; *g*, 10th foot ×20; *h*, 75th foot ×25; *i*, dorsal aciculum ×160; *k*, ventral abdominal aciculum ×160; *l*, anterior region, side view ×4.

foot papillae, 3—5 vertical rows of large yellow, bent, blunt hooks (uncini). Transverse rows of ventral papillae on segments 17—20—27—32. Abdominal dorsal cirri chopper-shaped. Dorsal forked setae; a long intermediate cirrus. Ventral ramus bilobed, with fine serrulate setae and a small conical ventral cirrus. Spear-shaped spines and special glands absent. Gills from the 5th setigerous segment, broadly lanceolate.

var. persica Fauvel. (Fig. 156, *a—d*)

Gills begin on the 7th setigerous segment, instead of the 5th. Intermediate cirrus much longer than the ventral ramus. 25 thoracic segments with vertical rows of genuine hooks with bent, blunt tip and guard, and 2—3

Fig. 156.—*Aricia cuvieri* Aud. & M.-Edw., var, *persica* Fauvel: *a*, abdominal foot ×40; *b, c, d*, uncini, front and side view ×150.

intermediate segments. About 10 foot-papillae on the mid-thoracic segments. Ventral papillae present from 23rd to 31st thoracic segments, in crowded rows of 10—11 on each side, nearly meeting in the middle. In the abdominal region, the gills are long. The intermediate cirrus (*intercirrus*) is about 1½ times as long as the ven-

tral ramus, whilst in typical *A. cuvieri* it is shorter, or at most, of the same length.

Occurrence: Persian Gulf.

Distribution: Of typical form, Atlantic Ocean, Mediterranean Sea, North Sea.

292. Aricia nuda Moore. (Fig. 157, *a—d*).

Aricia nuda, Moore, 1911, p. 311: Eisig. 1914, p. 345: Fauvel, 1932, p. 162, fig. 25.

Body large. Prostomium small, conical. Thoracic setigerous segments 15. Gills begin on the 5th setigerous segment; the posterior ones are very long and slender.

Fig. 157.—*Aricia nuda* Moore: *a*, 26th foot ×30; *b*, 28th foot ×30; *c*, subuluncinus ×300; *d*, hastate spine ×120.

Ventral thoracic feet with a fringe of foot papillae and vertical rows of *subuluncini* [genuine hooks (*uncini*) absent], and capillary setae. From the 12th to the 15th setigerous segment 4—5 very large spear-headed spines in

each foot. Ventral papillae (*subpodiale*) absent. In the abdominal feet, capillary setae and forked setae. Intermediate cirrus absent.

Occurrence: Off Akyab, Burma, 34 fms.

Distribution: California; Burma.

293. **Aricia exarmata** Fauvel. (Fig. 158, *a—d;* Fig. 159, *a—e*)

Aricia exarmata, Fauvel, 1932, p. 163, figs. 26—27.

Body of very large size, depressed, enlarged in the thoracic region, semi-cylindrical in the abdominal region.

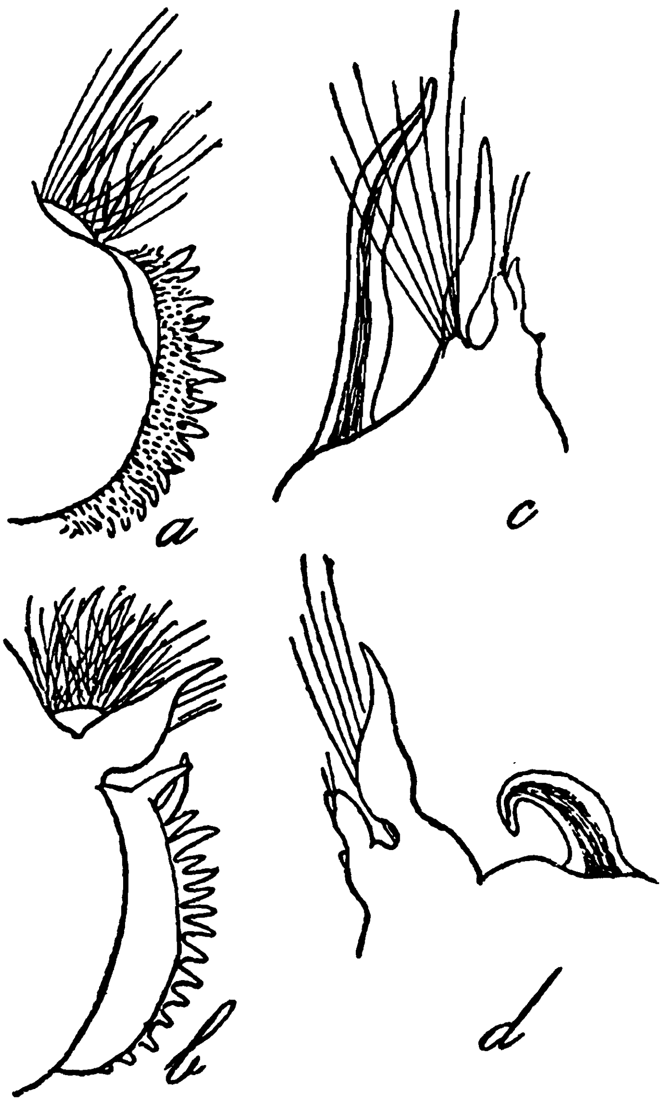

Fig. 158.—*Aricia exarmata* Fauvel: *a, b,* thoracic foot, anterior and posterior view ×11; *c, d,* abdominal feet ×11.

Prostomium rather small, blunt, conical, without eyes. Thoracic setigerous segments 15—16 (the 16th often smaller, intermediate). Gills begin in the 5th setigerous segment. The anterior ones are triangular, lanceolate;

the abdominal ones long and narrow. Dorsal ramus with an asymmetrical chopper-shaped dorsal cirrus with pointed tip; a bundle of camerated capillary setae. Ventral ramus a flattened vertical pad, with a narrow elongated lamella bearing a fringe of about 12–15 long conical papillae, several vertical rows of bent *subuluncini* and long serrated capillary setae. *Genuine hooks (uncini) and spear-shaped spines absent.* Ventral papillae (*subpodiale*)

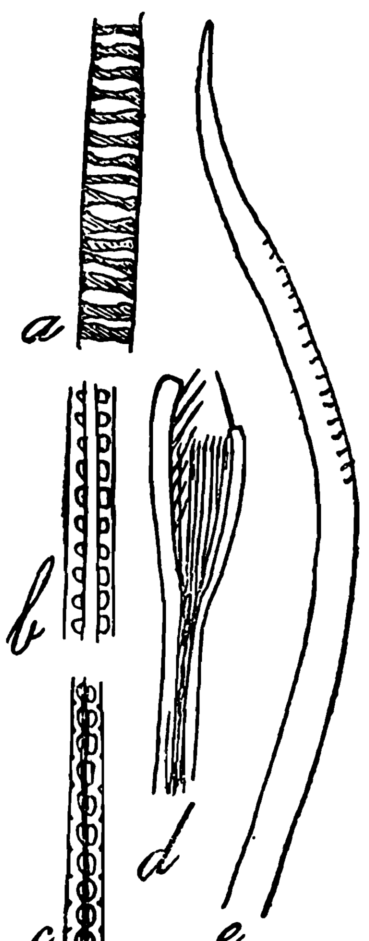

Fig. 159.—*Aricia exarmata* Fauvel: *a, b* and *c,* parts of camerated setae ×500; *d,* forked seta ×520; *e,* subuluncinus ×150.

absent. In the abdominal region, a long dorsal cirrus faintly cultriform, a bundle of long slender, forked, serrated setae. Intermediate cirrus (*inter-cirrus*) absent. Ventral ramus erect, bilobed, with an aciculum and a few slender capillary setae. Ventral cirrus reduced to a small subulate knob. Proboscis with membranaceous lobes encircling the mouth. A dorsal three-lobed sense-organ.

Differs from *A. nuda* chiefly in the absence of large spear-headed spines.

Length: Thorax 20 mm. long, 9–10 mm. broad and 4–5 mm. thick.

Occurrence: Bay of Bengal, 133 fms. (brown mud); a large number of specimens, all incomplete behind.

Genus SCOLOPLOS Blainville.

Prostomium conical, a pair of erect lanceolate gills on all segments except a few anterior ones. Thoracic feet with an erect dorsal cirrus and a bundle of serrated capillary setae. Ventral ramus pad-like, with vertical rows of capillary setae mixed with hooks, or without them. One to three foot papillae, or none. Ventral papillae usually absent. In the abdomen, an erect dorsal cirrus, capillary setae and forked setae. Intermediate cirrus (*inter-cirrus*) absent. Ventral ramus bilobed, with capillary setae. Ventral cirrus often absent.

Key to the species of Scoloplos.

1. Gills multifid	*latus* (Chamberlin), p. 309.
Gills simple ..	2
2. Pocket-like membranes below the feet ..	*marsupialis* Southern, p. 306
No such pocket-like membranes	3
3. Gills begin from 7th segment	*chevalieri* (Fauvel), p. 308.
Gills begin from 20th–22nd segment	*kerguelensis* McIntosh, p. 307

294. **Scoloplos marsupialis** Southern. (Fig. 160, *d–g*).

Scoloplos marsupialis, Southern, 1921, p. 632, pl. XXVII, fig. 19. Gravely, 1927, p. 22, pl. IX, fig. 11: Fauvel, 1932, p. 165.

Body flattened in front. Prostomium conical, composed of two rings. 17–19 thoracic segments. Short ventral hooks and capillary setae on the 8–9 anterior feet. Gills begin about 13th–15th foot. From about 18th foot a pocket-shaped, large, thin membrane behind and beneath the ventral cirrus. In the abdominal region, an erect dorsal cirrus, a bundle of capillary serrated setae; ventral ramus bilobed, with fine capillary setae. A small rounded lateral organ between the two rami.

Length: 50 mm. 210 segments.

Occurrence: Chilka Lake, Manikpatna Island; Gulf of Mannar, Krusadai Island, in sand and mud; Tuticorin Beach.

295. Scoloplos kerguelensis McIntosh. (Fig. 160, *a—c*)

Scoloplos kerguelensis, McIntosh, 1885, p. 355, pl, XLIII, figs. 6—8; pl. XXIIA, fig. 19: Willey, 1902, p. 275: Eisig, 1914, p. 378: Augener, 1914, p. 26: Fauvel, 1932, p. 165.

Prostomium large, conical but rather blunt. Anterior region spindle-shaped, not quite flattened, of 12—19 segments, with only long serrated bristles, devoid of thora-

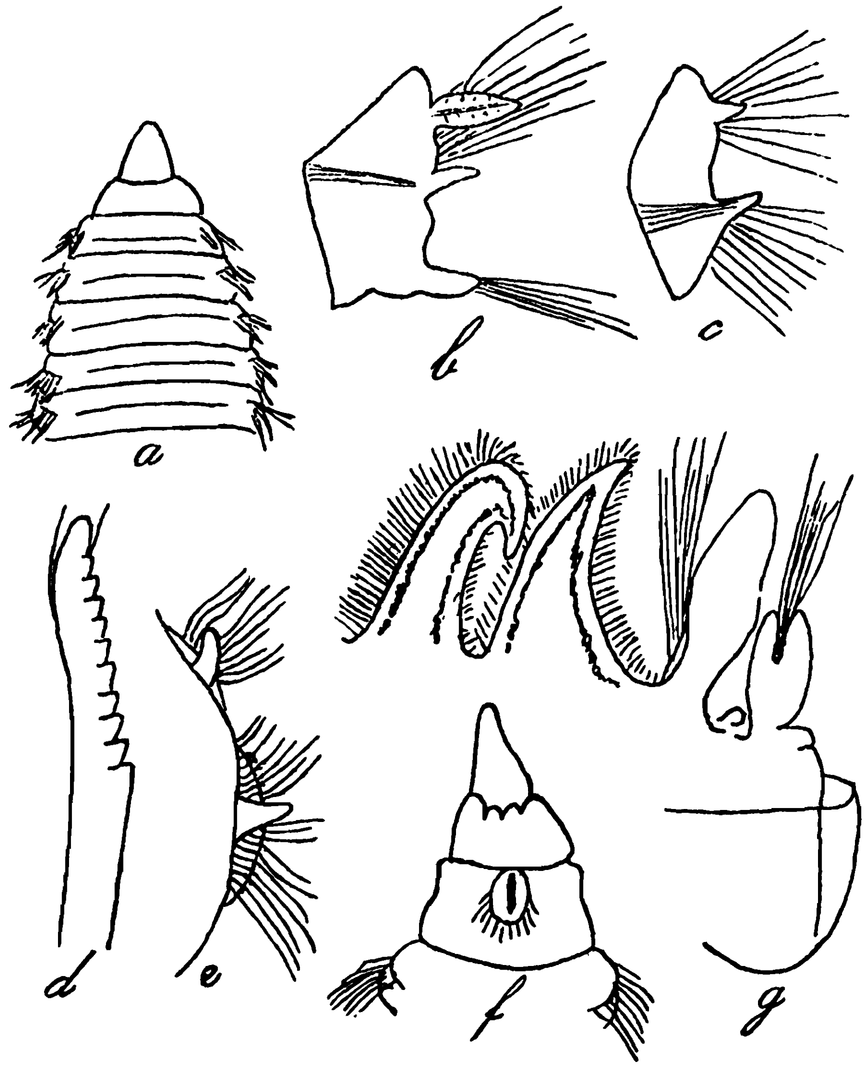

Fig. 160.—*Scoloplos kerguelensis* McIntosh: *a*, anterior part, dorsal view, enlarged; *b*, 20th foot ×31; *c*, 8th foot ×31 (after McIntosh). *Sc. marsupialis* Southern: *d*, short hook from 6th foot ×870; *e*, 4th right foot ×78; *f*, anterior end, ventral view ×44; *g*, 30th right foot, with pouch ×54, (after Southern).

cic hooks, foot and ventral papillae. The two rami close to each other, without any well marked setigerous lobe, except in the 3—6 last thoracic segments, which have a very small conical dorsal cirrus and the ventral pad of which bears a very small, inconspicuous median point, which can hardly be considered as a foot-papilla. Gills begin on the 20th, 21st, or 22nd setigerous segment, usual-

ly on the 21st; they are triangular, broad and short. The pygidium bears two long, filiform, anal cirri.

Length: 25—120 mm. by 1—2 mm.

Colour: Red, in life.

Occurrence: Vizagapatam.

Distribution: Antarctic Ocean, Kerguelen, Falkland Islands, Australia; India.

Remarks: Eisig (1914, p. 378) considers it to be synonymous with *Sc. armiger* Müller, but this is open to doubt.

296. Scoloplos chevalieri (Fauvel) (Fig. 161, *a—f*).

Aricia chevalieri, Fauvel, 1901, p. 83, figs. 22—28; 1907, p. 18: Gravier, 1906, p. 167, pl. II, figs. 193, 195.
Scoloplos chevalieri, Eisig, 1914, p. 418: Fauvel, 1930, p. 35.

Body long, slender. Prostomium sharp pointed. A pair of nuchal organs. 20—27 thoracic segments, each with a dorsal cirrus and slender serrated capillary setae. 4—5 vertical rows of short, brown, blunt, sigmoid hooks mixed

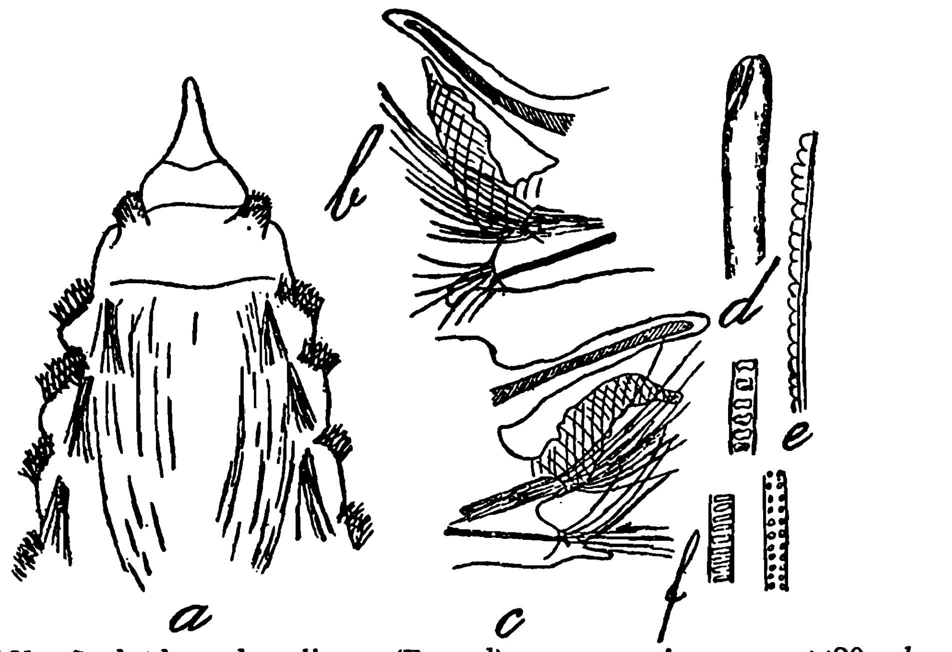

Fig. 161.—*Scoloplos chevaliem* (Fauvel): *a*, anterior part ×20; *b*, *c*, feet×40; *d*, hook from the anterior segments ×350; *e*, *f*, parts of capillary bristles, front and dorsal views ×350.

with 2—3 capillary setae. *Podiale and ventral papillae absent.* Lanceolate gills begin on the 7th segment. In the posterior part, gills longer than the broad foliaceous cirrus; dorsal capillary setae and 2—3 forked setae; a short ventral process with a stout blunt aciculum and capillary setae. There is no intermediate cirrus. Lateral organs. Two pairs of anal cirri.

Length: 50–60 mm. by 1–2 mm.

Occurrence: Gulf of Mannar, Krusadai and Shingle Islands, Krusadai Lagoon, in muddy sand.

Distribution: Indian Ocean, Red Sea; Atlantic Ocean (Casamance River).

297. **Scoloplos latus** (Chamberlin) (Fig. 162, *a–e*).

Branchethus latum, Chamberlin, 1919, p. 358, pl. LXIV, figs. 7–11, pl. LXV, figs. 1–2.

Scoloplos latus, Fauvel, 1932, p. 167, fig. 28, *a–e*.

Body of large size, much depressed in the anterior part, semi-cylindrical in the middle and posteriorly, ventral side convex. Prostomium small, conical, blunt. Two small, rounded, nuchal organs. Peristomium achae-

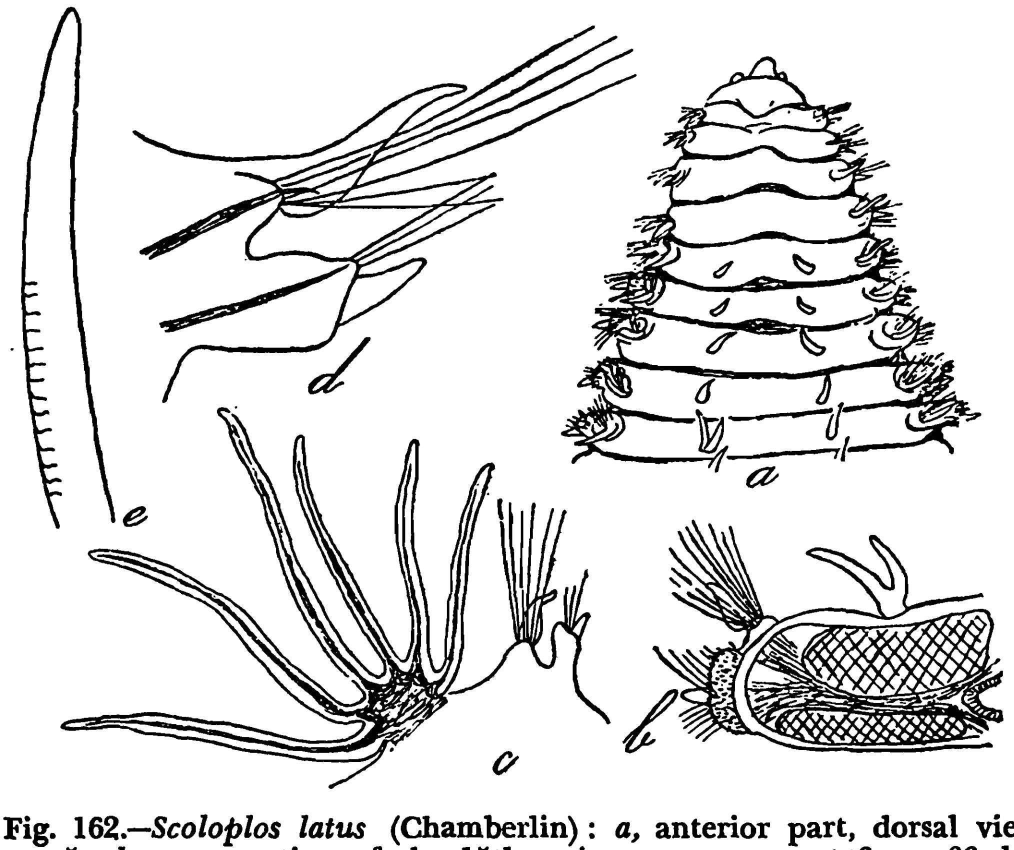

Fig. 162.—*Scoloplos latus* (Chamberlin): *a*, anterior part, dorsal view ×5; *b*, cross section of the 15th setigerous segment ×6; *c*, 33rd foot with 6 gill filaments ×7; *d*, 58th foot ×20; *e*, ventral hook from the 13th foot ×117.

tous. Thorax of 17–18 segments. Dorsal ramus with a conical dorsal cirrus, a short setigerous lobe with a bundle of serrate capillary setae. Ventral ramus a transverse compressed pad with camerated capillary setae, stout bent hooks and a single conical foot-papilla, inserted back-

wards in the middle of the foot. Ventral papillae (*sub-podiale*) absent. In the abdominal region an erect dorsal cirrus, an aciculum and a bundle of slender capillary setae. Intermediate cirrus (*intercirrus*) absent. Ventral ramus erect, divided into two unequal lobes, one short and blunt, the other cirriform and tapering, an aciculum, a few capillary setae. Ventral cirrus absent. Gills begin on the 5th setigerous segment. The first few gills are simple, the next few are bifid, and from the 16th foot they have 5—9 long, simple, filaments arising from a short transverse base separated from the foot. In the abdominal region, these long gill-filaments bend backwards, overlap and completely cover the dorsum. Dorsal sense organs, from the 16th—17th segment; they consist of two small elongated pads in the middle of each segment.

Breadth: Of thorax 10 mm.

Colour: greyish, colourless in spirit.

Occurrence: Off Akyab, Burma, 250 fms.

Distribution: Pacific Ocean, off Panama, Bay of Bengal.

Genus NAINEREIS Blainville.

Theodisca Müller; *Naidonereis* Malmgren; *Anthostoma* Schmarda.

Prostomium rounded. Two eyes. A pair of erect lanceolate gills on each segment, except on a few anterior ones. Thoracic feet with an erect dorsal cirrus and a bundle of serrated capillary setae and forked setae. Ventral ramus pad-like, with a foot papilla and several rows of hooks and *subuluncini*. *No ventral rows of papillae.* In the abdomen, an erect dorsal cirrus, capillary setae and forked setae. No intermediate cirrus. *No ventral cirrus.* Ventral ramus bilobed, with capillary setae. Dorsal sense organs.

298. **Nainereis laevigata** (Grube) (Fig. 163, *a—l*)

Nainereis laevigata, Fauvel, 1927a, p. 22, fig. 7, *a—l*.

Aricia laevigata, Saint-Joseph, 1898, p. 301.

Theodisca anserina, Claparède, 1864, p. 504.

Theodisca hexaphyllum, McIntosh, 1905, p. 63.

Scoloplos hexaphyllum, Augener, 1926, p. 462.

Body flattened anteriorly, rounded posteriorly. Proboscis with large palmate lobes. 15—31 thoracic feet, gills

begin from 4th—11th setigerous segment, long, slender. Dorsal cirrus knife-like. Dorsal capillary setae crenate, forked setae with unequal, short, ciliated limbs, subulate acicula. Ventral ramus semi-circular, pad-like, with an upper papilla, short yellow setae with a long, narrow, denticulate point (*subuluncini*) and true hooks. In the posterior region, a dorsal cultriform cirrus, a bundle of

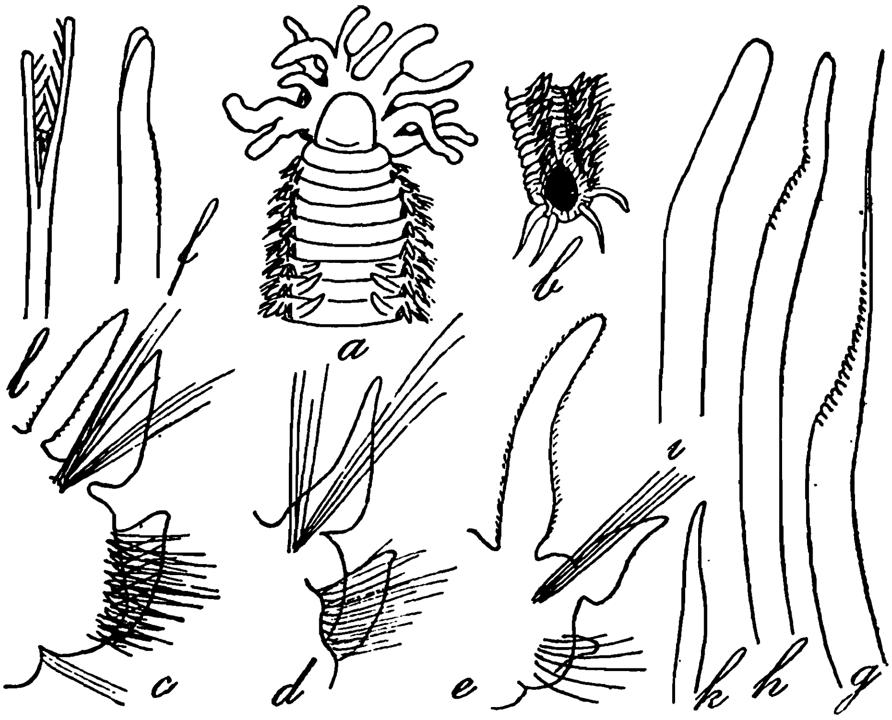

Fig. 163.—*Nainereis laevigata* (Grube): *a*, anterior part, proboscis extruded ×5; *b*, pygidium ×5; *c, d, e*, anterior, middle and hind feet ×22; *f*, hook ×330; *g, h, i*, subuluncini, more or less worn ×330; *k*, ventral aciculum ×247; *l*, forked seta ×330.

capillary setae, 1—2 forked setae. Ventral ramus with two languets, long capillary setae and 3—5 stout acicula. No ventral cirrus. Anus dorsal. Four anal cirri. Statocysts on segments 1—23.

Length: 120—250 mm. by 4—5 mm.

Colour: in life, pink, red or brownish.

Occurrence: Ceylon, in sand at low water or under stones.

Distribution: Japan, Indochina; Persian Gulf; Atlantic Ocean, Mediterranean Sea.

Family SPIONIDAE Sars.

Body vermiform, not clearly divided into distinct regions. Prostomium without tentacles, sometimes with lateral peaks. Eyes present. Two very long tentacle-like

palps. Proboscis unarmed. Parapodia biramous. Dorsal and ventral cirri foliaceous. Dorsal gills simple (rarely pinnate) on a number of segments. Simple capillary setae and hooded hooks.

Key to the genera of SPIONIDAE.

1. Fourth or fifth setigerous segment modified	2
Neither fourth nor fifth setigerous segment modified	3
2. Fifth setigerous segment modified	*Polydora* Bose, p. 315.
Fourth setigerous segment modified	*Polydorella* Angener, p. 322.
3. Prostomium with frontal peaks	*Scolelepis* Blainville, p. 313.
Prostomium without frontal peaks	4
4. Dorsal and ventral hooded hooks	5
Dorsal hooded hooks absent	*Laonice* Malmgren, p. 315.
5. Gills on almost all segments, an anal cup . ..	*Nerine* Johnston, p. 312.
Gills on only a few anterior segments, anal cirri ..	*Prionospio* Malmgren, p. 323.

Genus NERINE Johnston.

Prostomium without frontal peaks, with one occipital, tentacle-like, keel. Gills from the second setigerous segment almost to the last segments. Dorsal lamella more or less joined to the gill in the anterior segments; an elongated ventral lamella. In the anterior region, only dorsal and ventral capillary setae; more posteriorly, hooded hooks in both rami. An anal cup.

299. **Nerine cirratulus** Delle Chiaje. (Fig. 164, g–n).

Nerine cirratulus, Fauvel, 1927a, p. 36, fig. 11, *g–n,* (Synonymy).

Prostomium sharply conical, with a posterior occipital peak reaching to the 2nd–3rd segment. Four small eyes. Long slender palps. Gills from the second setigerous segment, absent only on a few last segments. Dorsal lamellae long, joined to the gills on the greater part of their length in the anterior region, but less in the posterior region. Ventral lamellae narrow, bilobed in the posterior part. Hooded hooks bidentate. A large anal cup.

Length: 50–80 mm. by 2–3 mm.

Colour: in life, blueish-green.

Occurrence: Vizagapatam Channel. Only the anterior part of a small specimen, which appears to belong to this species, was obtained.

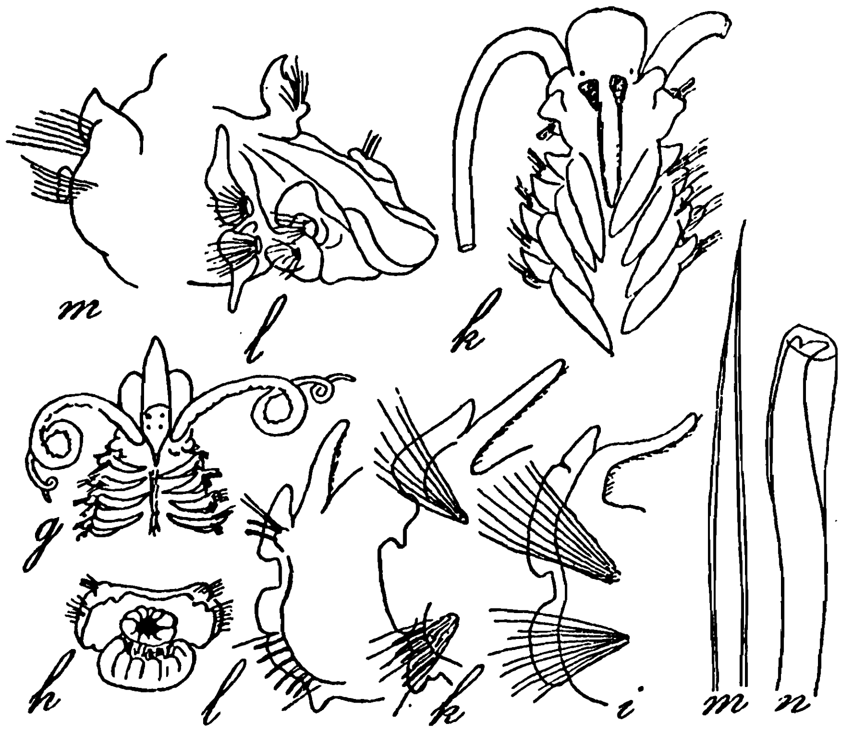

Fig. 164.—*Nerine cirratulus* (Delle Chiaje): *g*, anterior part enlarged; *h*, pygidum; *i*, 10th foot ×24; *k*, 45th foot ×24; *l*, 85th foot ×24; *m*, capillary bristle ×320; *n*, ventral hooded hook ×320. *Prionospio cirrifera* Wiren (the top three figures); *k*, anterior part, enlarged; *l*, head, side view ×32; *m*, first foot ×48.

Distribution: Atlantic Ocean, Mediterranean Sea.

Genus SCOLELEPIS Blainville.

Prostomium with two frontal peaks, ending posteriorly in a crest (*carina*) Two long thick palps. Gills from the first setigerous segment to the last ones. Dorsal lamellae partly joined to the gills. Ventral lamellae not notched. Hooded hooks only on the posterior ventral rami: always absent on the dorsal ramus. Anal cirri.

300. Scolelepis indica Fauvel. (Fig. 165, *g—m*).

Scolecolepis indica (sic), Fauvel, 1928, p. 93, fig. 2, *g—m;* 1930a, p. 35, fig. 7, *g—m;* 1932, p. 170.

Body long, slightly broader and flattened anteriorly, filiform behind. Prostomium shield-shaped, with two frontal peaks well marked and laterally inserted. The prostomium ends posteriorly in a pointed keel extending back to the second setigerous segment, but not raised into an occipital tentacle. Two irregular clusters of very small

and numerous eye-spots. Two long and stout, spirally curling palps. Gills beginning on the first setigerous segment. In the anterior region, the long cirriform gills cross over the back. Dorsal lamella erect, lanceolate, attached to the outer border of the gill only at its base. Ventral lamella rounded or oval, slightly mucronate, not notched; posteriorly it is reduced gradually to a decreasing crescent. Dorsal capillary setae neither winged nor dotted. Ventral setae similar but shorter and somewhat

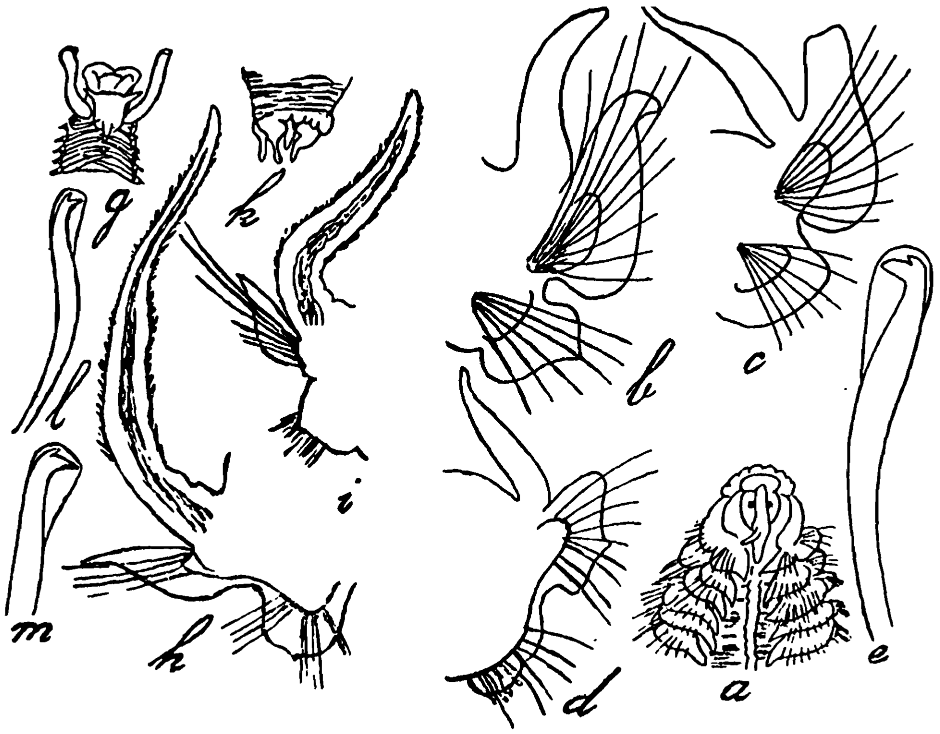

Fig. 165.—*Laonice cirrata* Sars: *a*, anterior part, enlarged; *b*, 12th foot ×16; *c*, 22nd foot ×16; *d*, 40th foot ×16; *e*, hooded hook ×320. *Scolelepis indica* Fauvel. *g*, head ×6; *h*, 10th foot ×32; *i*, 73rd foot ×32; *k*, pygidium; *l*, ventral hook from the last segments ×320; *m*, posterior ventral hook ×320.

dotted, with a bundle of 5—6 short, larger, curved ones with a tapering bent tip. Hooded ventral hooks bidentate, 2 to 6 in each ramus, from about the 70th setigerous segment. Dorsal hooks absent. In the last segments, gills short, no more marked lamellae, long and slender capillary setae; in the ventral ramus, 1—2 curved setae, 5—6 hooks and 1—2 long slender setae. Pygidium bearing 4 short finger-shaped cirri. Anus terminal.

Length: 60 mm., or more, by 1 to 1.5 mm.

Colour: in life pink.

Occurrence: Vizagapatam; Gulf of Mannar; Krusadai Island.

Genus LAONICE Malmgren.

Prostomium rounded, without frontal peaks, ending posteriorly in a raised occipital tentacle. Two eyes. Palps large. Gills beginning at the second setigerous segment and existing only in the anterior part of the body. The dorsal lamella is not attached along the gill. Ventral lamella not notched. Genital pouches present. In the anterior region only dorsal and ventral capillary setae; more posteriorly hooded hooks on the ventral ramus only. Anal cirri.

301. Laonice cirrata Sars. (Fig. 165, *a—e*).

Laonice cirrata, Söderström, 1920, p. 220, fig. 128: Fauvel, 1927a, p. 38, fig. 12, *a—e*.
Aonides cirrata, Fauvel, 1914b, p. 220, pl. XX, figs. 4—9.
Spionides japonicus, Moore, 1907, p. 204.

A long dorsal crest (sense organ) on the first 28—30 segments. Gills 35—45 pairs only, long, cirriform, folded on the back, separate from the dorsal lamella all along. Dorsal lamellae large, auriculate in the branchiate segments; smaller, triangular and ovate in the succeeding ones. Ventral lamellae oval, rounded in the succeeding segments. From about the 25th foot, in mature specimens, pigeon-nest shaped genital pouches between the lamellae. Ventral hooded hooks bidentate from about the 40th—50th foot.

Length: 90—120 mm. by 3—5 mm.

Colour: yellowish, darker behind.

Occurrence: Off Puri, Orissa.

Distribution: Japan; India; Atlantic Ocean, Mediterranean Sea; Arctic Seas.

Genus POLYDORA Bose.

Prostomium blunt or notched in front, ending posteriorly in a crest. Gills begin beyond the 6th—9th foot, rarely on the 2nd. *Fifth setigerous segment highly modified, with peculiar stout dorsal bristles.* Dorsal and ventral capillary bristles; ventral bidentate hooded hooks from the 7th—8th foot. An anal cup, simple or lobed.

Key to the species of Polydora.

1. Gills begin on the 2nd setigerous segment	Subgenus *Boccardia*
Gills begin after the 6th setigerous segment	2

2. Ventral hooded hooks begin at the 8th segment. On the 6th, setae set in a horse-shoe	Subgenus *Carazzia* 3
Ventral hooded hooks begin on the 7th setigerous segment. No horse-shoe	Subgenus *Polydora* 4
3. Abnormal setae of the 5th setigerous segment pointed, spoon-shaped	*antennata* Claparède, p. 316.
Abnormal setae of the 5th setigerous segment with curved, blunt tip	*kempi* Southern, p. 317.
4. No special dorsal setae on the last segments	5
Special dorsal setae on the last segments	6
5. Hooks of the 5th setigerous segment, with a neck and a lateral tooth	*hornelli* Willey, p. 318.
Hooks of the 5th setigerous segment without a neck, lateral tooth diverging	*ciliata* Johnston, p. 319.
6. Bundles of very slender setae on the last segments	*flava* Claparède, p. 321.
Posterior dorsal setae awl-like	7
7. Gills begin on the 7th setigerous segment	*armata* Langerhans, p. 321.
Gills begin on the 8th setigerous segment	*coeca* Oersted, p. 319.

Subgenus CARAZZIA Mesnil.

302. Polydora (Carazzia) antennata Claparède. (Fig. 166, *i—m*)

Polydora antennata, Fauvel, 1927a, p. 56, fig. 19, *i—m*, (Synonymy); 1930a, p. 36; 1932, p. 172.
Carazzia antennata, Mesnil, 1896, p. 227, pl. XIV, figs. 22—25.

Prostomium with two tentacle-like lobes in front and a small erect occipital tentacle. Four eyes. On the first setigerous segment well marked dorsal and ventral lamellae, ventral capillary setae but *no dorsal ones*. Large gills beginning on the 7th foot. Peculiar setae of the 5th setigerous segment, pointed and hollowed at the shoe-shaped tip, arranged in the form of a horse-shoe with lanceolate setae. Ventral hooded hooks from the 8th foot. No peculiar posterior setae. Anal cup notched on dorsal and ventral borders.

Length: 20—30 mm.

Colour: uniformly yellowish.

Occurrence: Gulf of Mannar, Krusadai Island.

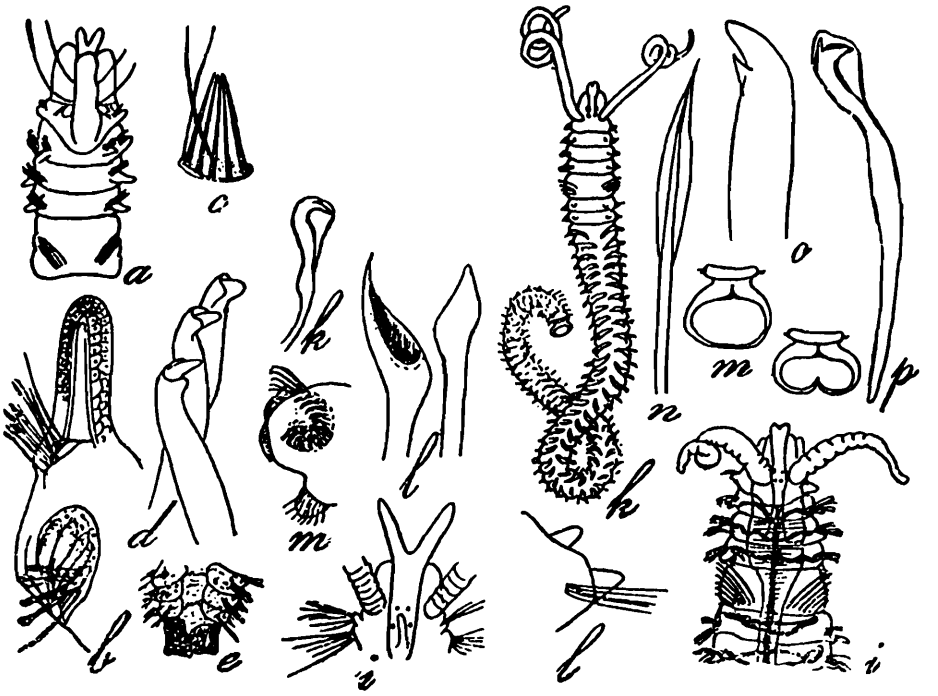

Fig. 166.—*Polydora* (*Polydora*) *armata* Langerhans: *a*, anterior part; *b*, 7th foot ×32; *c*, dorsal posterior bristles ×240; *d*, stout hooks from the 5th segment ×176; *e*, pygidium ×36. *P.* (*Carazzia*) *antennata* Claparède: *i*, head ×13; *k*, hooded hook ×240; *l*, stout hook from the 5th segment ×192; *m*, 5th foot ×36. *P.* (*Polydora*) *ciliata* Johnston (Figs. on right-hand side); *i*, anterior part, enlarged; *k*, ×4; *l*, first foot; *m*, anal cup; *n*, lancet-shaped seta from the 5th segment ×320; *o*, stout hook of the 5th segment ×320; *p*, hooded hook ×320.

Distribution: India, Arabian Sea; Atlantic Ocean, Mediterranean Sea.

303 Polydora (Carazzia) kempi Southern. (Fig. 167, *a*—*c*).

***Polydora* (*Carazzia*) *kempi*, Southern, 1921, p. 636, pl. 28, figs. 20.**

Prostomium rather small and broad, bilobed, without caruncular prolongation, but with a large erect occipital tentacle. Four black eyes. On the first setigerous segment, *no dorsal setae*, a stumpy round papilla, a ventral lobe with a row of slender capillary setae. No ventral lamella. On the 2nd to 6th segment dorsal and ventral bundles of capillary setae, the dorsal long, slender, the ventral flattened. A dorsal rounded lamella. *The 5th setigerous segment is less modified than in any other species, with dorsal superior setae long and narrow capillaries;* the inferior dorsal setae consist of two rows of modified setae; the anterior setae are bi-limbate capillaries,

short, with broad wings, rapidly tapering; the posterior row consists of *rather stout hooks with curved tips.* The ventral setae are lance-shaped. The gills appear on the 7th segment, they are quite free from the dorsal lamellae; there are only 10—11 pairs of them. Ventral hooks appear on the 8th setigerous segment; they are not accom-

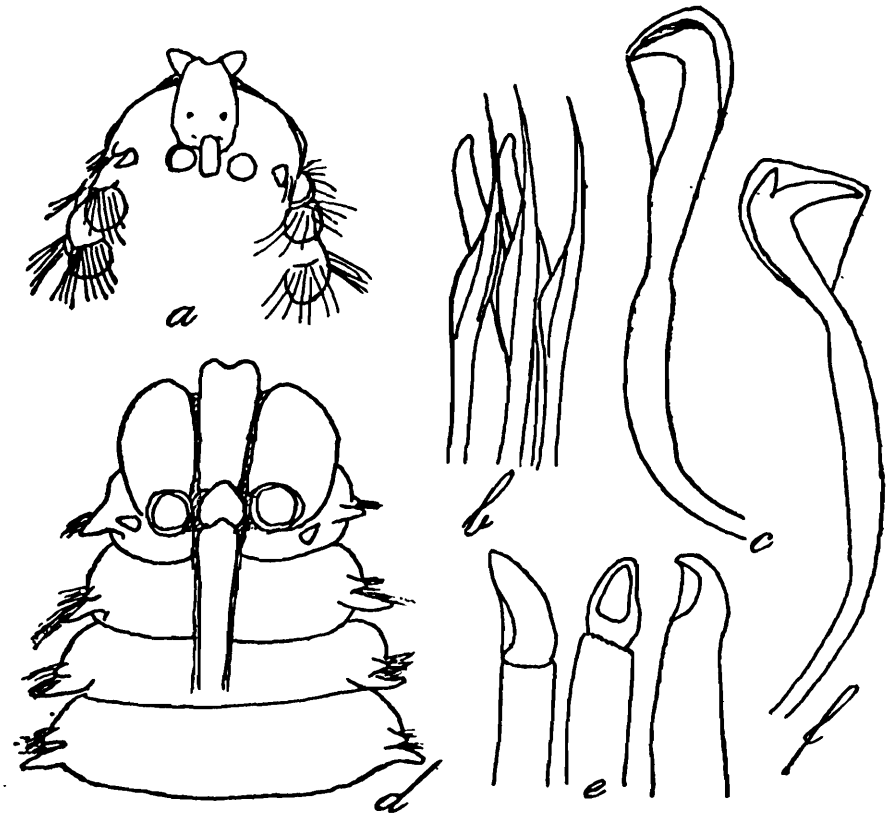

Fig. 167.—*Polydora* (*carazzia*) *kempi* Southern: *a,* anterior end, dorsal view ×50; *b,* lower dorsal setae from the 5th foot ×500; *c,* ventral hook from the 8th foot ×720 (after Southern). *P.* (*Polydora*) *hornelli* Willey : *d,* anterior end, dorsal view ×50 ; *e,* modified setae from the 5th segment ×320; *f,* ventral hook from the 38th foot ×500 (after Southern).

panied by any capillary setae and resemble those of *P. antennata.* Posterior region unknown.

Occurrence: In a canal at Chingrighatta, Calcutta Salt Lakes.

Subgenus POLYDORA Bose.

304. Polydora (Polydora) hornelli Willey. (Fig. 167, *d—f*).

Polydora hornelli, Willey, 1905, p. 286, pl. V, fig. 117: Southern, 1921, p. 634, pl. 28, figs. 21, AD.

Prostomium slightly notched, with two round lobes; it is prolonged backwards over the first 2—3 segments.

No eyes. Tentacles stout, long. On the first setigerous segment a small dorsal and a small ventral lamella. *No dorsal setae.* A bundle of ventral capillary setae. 2nd to 6th segments with two rows of setae. On the 5th setigerous segment an oblique row of long stout acicular, spoon-shaped hooks, *with a neck and a closely applied tooth,* accompanied by delicate spatulate setae. Gills and ventral hooks appear on the 7th setigerous segment and continue to the end. Last segments and pygidium unknown.

Length: 31 mm. and more, by 1.5 mm.

Colourless.

Occurrence: Chilka Lake; Gulf of Mannar. In crevices of oyster shells.

305. **Polydora (Polydora) ciliata** Johnston. (Fig. 166, *i. p*)

Polydora ciliata, Fauvel, 1927a, p. 49, fig. 16, *i–p,* (Synonymy); 1932, p. 172.

Prostomium faintly notched in front, prolonged backwards over the second segment. Four eyes. On the first setigerous segment, dorsal and ventral lamellae, *no dorsal setae,* ventral capillary setae. 2nd to 6th segments with both dorsal and ventral capillaries. On the 5th setigerous, stout hooks with a lateral spine, and lanceolate setae. Ventral bidentate hooks from the 7th setigerous segment. Gills from the 7th to the 10th penultimate segments. Anal cup notched dorsally.

Length: 20—30 mm. by 1 mm.

Colour: yellowish, both extremities and anal cup darker.

Occurrence: Chandipore, Orissa Coast.

Distribution: Australia; Indo-China; India, Red Sea; Atlantic Ocean, Mediterranean Sea, Falkland Islands.

306. **Polydora (Polydora) coeca** Oersted. (Fig. 168, *a—k*)

Polydora coeca, Fauvel, 1927a, p. 52, fig. 18, *a–k;* Gravely, 1927, p. 23.

Prostomium deeply notched, prolonged backwards over the first two segments. Generally eye-less. Tentacles long and slender. On the first setiger, a small dorsal and a small ventral lamella, *dorsal and ventral capillary setae.* On the 5th setigerous segment, stout spoon-shaped hooks, without lateral tooth, accompanied by lancet-

shaped setae. Ventral bidentate hooded hooks from the 7th setigerous segment. In the posterior region, the anterior dorsal winged setae are replaced by 3—4 *small, straight awl-shaped setae*: *there are no bundles of slender*

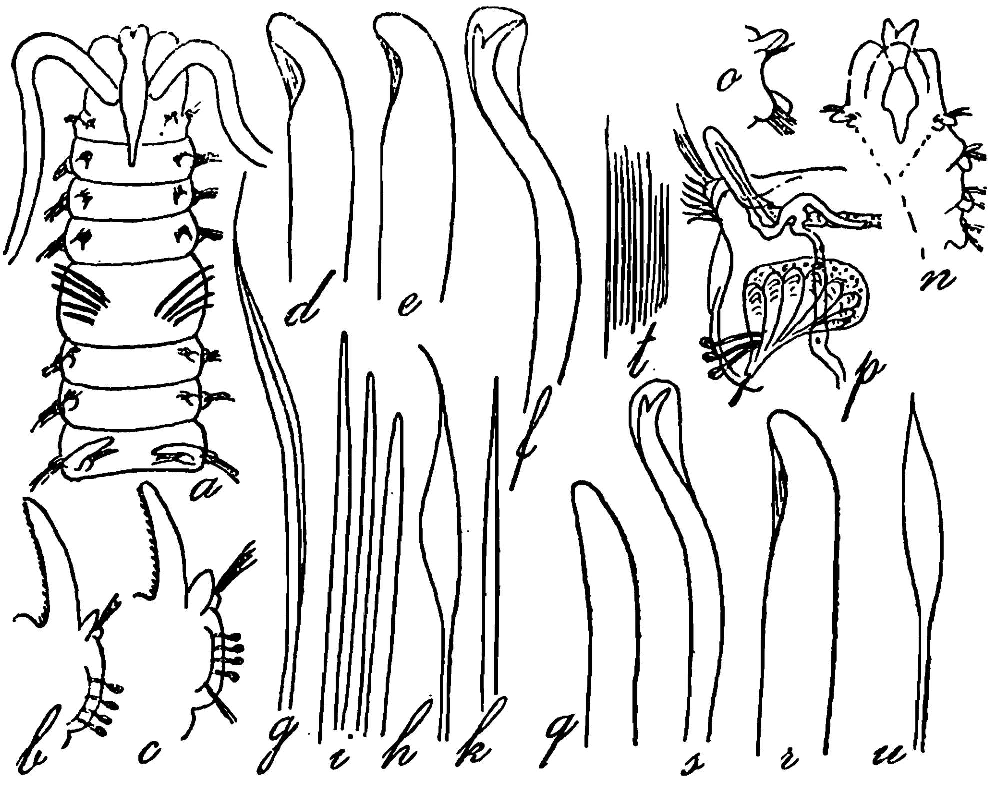

Fig. 168.—*Polydora* (*Polydora*) *coeca* (Oersted): *a*, anterior part; *b*, posterior foot ×40; *c*, foot from mid-body ×40; *d*, *e*, hooks from the 5th setigerous segment ×320; *f*, hooded hook ×320; *g*, winged seta ×320; *h*, lancet-shaped seta from the 5th segment: *i*, *k*, posterior bodkin setae ×320. *P.* (*Polydora*) *flava* Claparède: *n*, anterior part ×20; *o*, first setigerous segment ×36; *p*, 8th-setigerous segment ×48; *q*, *r*, special hooks from the 5th segment ×320; *s*, hooded hook ×320; *t*, bundle of slender posterior setae ×320; *u*, lancet-shaped seta from the 5th segment ×320.

setae. Gills begin on the 8th setigerous segment and are absent on the posterior half, or third, of the body. A deeply notched anal cup.

Length: 20—40 mm. by 1 mm.

Colour: yellowish. Boring in shells and coral rocks.

Occurrence: Gulf of Mannar; Krusadai and Shingle Islands. Amongst sponges.

Distribution: Indian Ocean; Atlantic Ocean, Mediterranean Sea; Arctic Seas.

307. Polydora (Polydora) armata Langerhans. (Fig. 166, (*a—e*).

Polydora armata, Fauvel, 1927a, p. 55, fig. 19, *a—e;* Willey and Watson, 1905, p. 325.

Prostomium notched, with two rounded horns; prolonged backwards on the first two segments. Generally eye-less. Tentacles rather long. On the first setigerous segment dorsal and ventral lamellae, *dorsal and ventral setae.* On the 5th setigerous segment 2—3 stout, peculiar setae with blunt hooks, two lateral processes connected by a transverse ridge; *no lance-shaped setae.* Ventral, bidentate, hooded hooks from the 7th setigerous segment backwards. *On the* 8—12 *last segments, on the dorsal ramus, a conical bundle of* 8—18 *stout brown acicular setae.* Only 5—7 pairs of gills beginning on the 7th setigerous segment. Anal cup with a dorsal, and sometimes, a ventral notch.

Length: 4—5 mm.

Colourless: Burrows in shells and calcareous Algae.

Occurrence: Ceylon, commensal with the sponge *Aulospongus tubulatus.*

Distribution: India; Atlantic Ocean (Madeira), Mediterranean Sea, English Channel.

308. Polydora (Polydora) flava Claparède. (Fig. 168, *n—u*).

Polydora flava, Fauvel, 1927a, p. 52, fig. 17, *m—n;* Augener, 1926, p. 461.

Prostomium notched into two sharp horns; prolonged backwards to the first two segments. No eyes. Tentacles long and slender. On the first setigerous segment, dorsal and ventral lamellae, *dorsal and ventral setae.* On the 5th setigerous segment stout spoon-shaped hooks without lateral tooth, accompanied by lance-shaped setae. Ventral bidentate hooded hooks from the 7th setigerous segment backwards. From the 8th setigerous segment backwards a dorsal bundle of very numerous, very slender, needle-like setae. Gills from the 8th setigerous segment (sometimes 7th or 9th), absent on the posterior third of the body. A broad anal cup with four notches.

Length: 20—45 mm.

Colour: yellowish.

Occurrence: Ceylon. In small muddy tubes on old shells and in rock clefts.

Distribution: Japan; Sumatra; India; Atlantic Ocean, Mediterranean Sea, English Channel.

Genus POLYDORELLA Augener.

Closely allied to *Polydora*. Setae nearly similar, but modified setae on the 4th setigerous segment, instead of the 5th. Pygidium not cup-like. Schizogamous.

309. Polydorella prolifera Augener. (Fig. 169, *a*–*g*)

Polydorella prolifera, Augener, 1914, p. 16, pl. I, fig. 3: Fauvel, 1930a, p. 36, fig. 8.
Post-larval Chaetopterid, Gravely, 1927, p. 24, pl. IX, figs. 12–14.

Prostomium rounded, bilobed, with two eyes. Long, stout, cylindrical palps. On the first setigerous segment a dorsal and a ventral bundle of slender capillary setae. Up to the 6th setigerous segment, only capillary setae, with

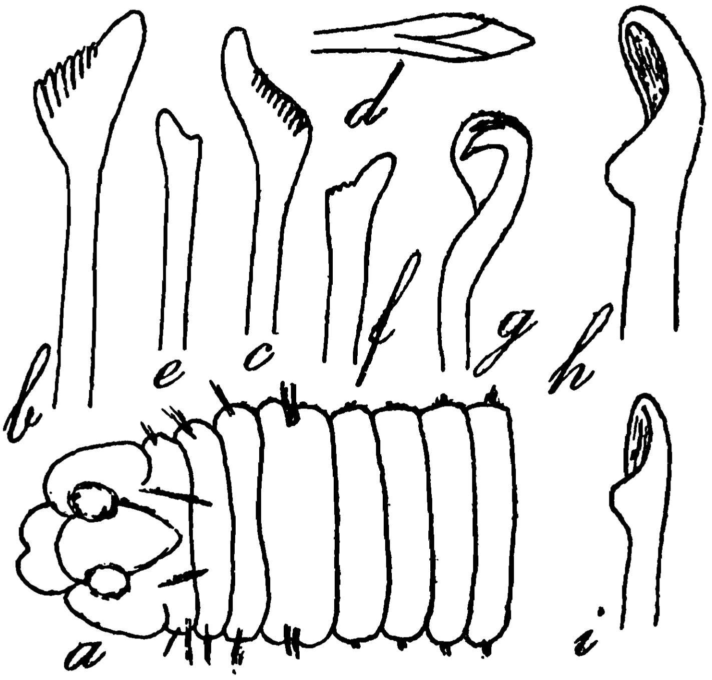

Fig. 169.—*Polydorella prolifera* Augener: *a*, anterior part, dorsal view (tentacles fallen off) ×45; *b*, *c*, *d*, peculiar setae from the 4th setigerous segment, side and front views ×550; *e*, *f*, spoon-shaped setae from the 4th segment ×550; *g*, hooded hook from the 7th foot. *Dodecaceria fistulicola* Ehlers: *h*, anterior spoon-shaped hook ×550; *i*, posterior hook ×550.

the exception of the 4th bearing the following modified setae: (1) a row of 3–6 large asymmetrical bristles with a denticulate or wrinkled crest and a blunt hook; (2) an inferior row of 3–6 smaller setae slightly enlarged at the tip, which is spoon-shaped, with a more or less blunt lateral process; (3) a few ventral, slender capillary setae.

About the 6th—7th setigerous segment appear the ventral hooks with a double curvature and a hooked tip with a very long and slender tooth running nearly parallel to the vertex which is provided with a broad hood. Gills, according to Augener, are only to be found on the 6th setigerous segment in a few specimens: they are simple filaments. 3—4 achaetous posterior segments. A conical pygidium, faintly notched, without cup or funnel. Anus terminal. " Proliferation takes place by the formation of the head of a daughter worm and a new tail for the parent between the ninth and tenth segments."

Occurrence: Gulf of Mannar. "Found in abundance, each in a minute mud-covered tube adherent throughout its length to the surface of a sponge." (Gravely).

Distribution: Australia; Gulf of Mannar.

Genus PRIONOSPIO Malmgren.

Prostomium short, rounded; frontal peaks and occipital tentacles absent. Eyes present. Long deciduous palps. Gills 3—11 pairs, often pinnate. Dorsal lamellae not bound to the gills. Ventral lamellae entire. Sometimes genital pouches present. Dorsal and ventral capillary setae. Dorsal and ventral pluridentate hooded hooks.

Key to the species of Prionospio.

1. Prostomium with large wings. All the gills pinnate ..	*pinnata* Ehlers, p. 323.
Prostomium without large wings	2
2. Gills pinnate. Genital pouches absent	*krusadensis* Fauvel, p. 326.
Gills simple	3
3. Gills all subulate, 6—13 pairs	*cirrifera* Wiren, p. 324.
Gills very numerous, the first few pairs long and filiform, the rest foliaceous	*polybranchiata* Fauvel, p. 324.

310. Prionospio pinnata Ehlers. (Fig. 174 *e*).

Prionospio pinnata, Ehlers, 1901, p. 163; 1908, p. 110: Fauvel, 1923c, p. 9; 1932, p. 173: Augener, 1927b, p. 351, fig. 2: Monro, 1937, p. 299.

Paraprionospio pinnata, Caullery, 1915, p. 356, fig. 2.

Paraprionospio tribranchiata, Berkeley, 1927, p. 11, pl. I; figs. 2—3.

Prionospio africana, Augener, 1918, p. 402, pl. VI, figs. 162—163.

(?) *Prionospio alata*, Moore, 1923, p. 185.

Prostomium enclosed between two upturned membranaceous wings. 3—4 pairs of pinnate gills beginning on the first setigerous segment. Gills of the second pair generally smaller. As the gills are very easily lost the differences in size are to be ascribed to regeneration. A well marked transverse crest, or ridge, arises between the first two setigerous segments: there are no ridges posteriorly.

Occurrence: Off Akyab, Burma, 250 fms.; Madras, Vizagapatam; Mormugao Bay; Maldive Archipelago.

Distribution: Pacific Ocean; Indian Ocean; Atlantic Ocean.

311. **Prionospio cirrifera** Wiren. (Fig. 164, *k—m*)

Prionospio cirrifera, Söderström, 1920, p. 237, figs. 134—146: Fauvel, 1927a, p. 62, fig. 21 (Synonymy); 1932, p. 174.
(?) *Prionospio multibranchiata,* Berkeley, 1927, p. 10, pl. I, fig. 1.

Prostomium rounded in front, ending behind in a crest extending to the 2nd—3rd setigerous segments. There are no membranaceous prostomial wings. Gills 6—13 pairs, all simple, beginning at the second setigerous segment. Anterior dorsal lamellae very large, and from 3rd to 6th feet sharp pointed. In mature specimens, genital pouches begin about 5th—7th setigerous segments. Ventral lamellae oval or rounded.

Length: 30 mm.

Colour: yellowish-white.

Occurrence: Vizagapatam.

Distribution: Vancouver (?) ; India; Atlantic Ocean; Arctic Seas.

312. **Prionospio polybranchiata** Fauvel. (Fig. 170, *a—g*)

Prionospio polybranchiata, Fauvel, 1929, p. 184; 1930a, p. 39, fig. 10, *a—g.*

Prionospio multibranchiata, Fauvel, (*non* Berkeley) 1928, p. 94, fig. 3, *a—g.*

Anterior region flattened, enlarged, tapering forwards; posterior region cylindrical. Above 40 segments. Prostomium elongate, anterior border rounded, ending posteriorly in a blunt ridge on the edge of the third setigerous segment. No eyes apparent. Two very long twisted palps reaching backwards to the 26th—30th segment. On the first setigerous segment the dorsal ramus is reduc-

ed to a small conical (achaetous?) nipple and a small ventral lamella and setae. Gills from the second setigerous segment, the first five pairs filiform, not pinnate, very long, reaching backwards to the 8th—10th setigerous segment; the following ones foliaceous, sub-triangular, elon-

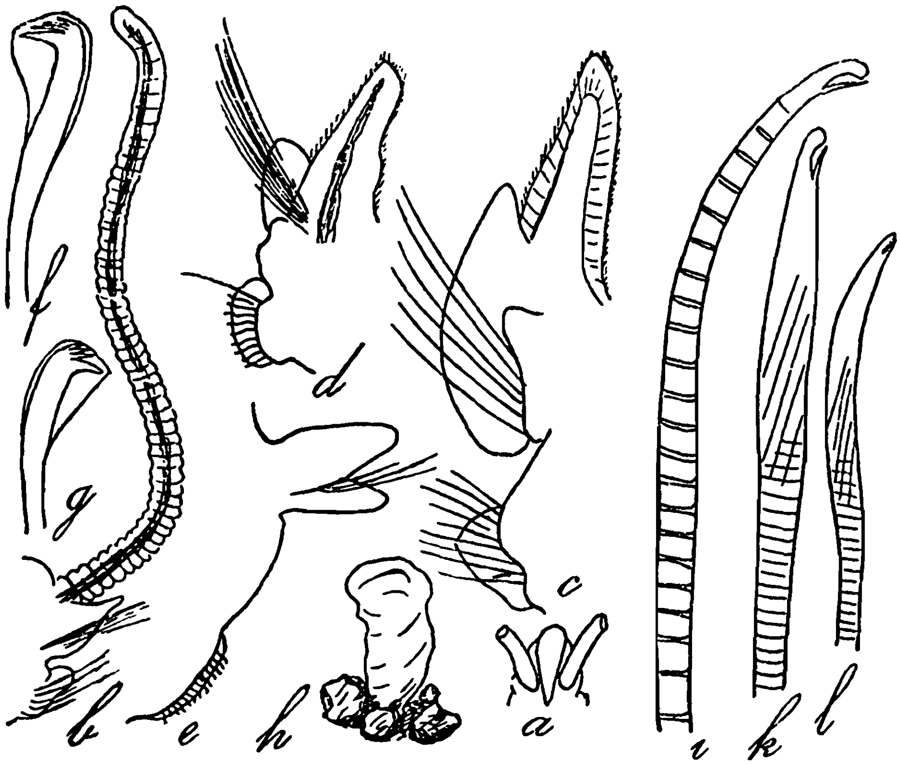

Fig. 170.—*Prionospio polybranchiata* Fauvel: *a*, prostomium, enlarged; *b*, 4th gill and foot ×24; *c*, 11th foot ×48; *d*, 29th foot ×48; *e*, 40th foot ×48; *f*, hook ×360; *g*, posterior hook ×360. *Stylarioides eruca* (Claparède), var. *indica* Fauvel; *h*, foot papilla ×112; *i*, *k*, *l*, three kinds of ventral setae from the same foot ×112.

gate, bent on the back and partly attached to the dorsal lamella: their size then decreases but they still exist on the 40th setigerous segment. Dorsal lamellae triangular, erect, rather large and free on the first 5 setigerous segments, after which their size decreases and they become more oval or subtriangular, then obsolete. In the anterior region the dorsal ridges are reduced to a very slender transverse wrinkle on each segment. Anteriorly, both dorsal and ventral setae are capillary. Ventral pluri-dentate hooded hooks from the 22nd setigerous segment. At the 40th they are still absent in the dorsal ramus. No genital pouches. Pygidium unknown.

Length: more than 11 mm. by 2 mm.

Discoloured in spirit.

Occurrence: Gulf of Mannar.

313. Prionospio krusadensis Fauvel. (Fig. 171, *a—e*).

Prionospio krusadensis, Fauvel, 1929, p. 182, fig. 2; 1930, p. 38, fig. 9.

Body slender, filiform, slightly enlarged anteriorly. Prostomium, long, conical, with a blunt ridge running to the 2nd segment. A low lateral fold, which does not form a marked wing, on each side of the prostomium.

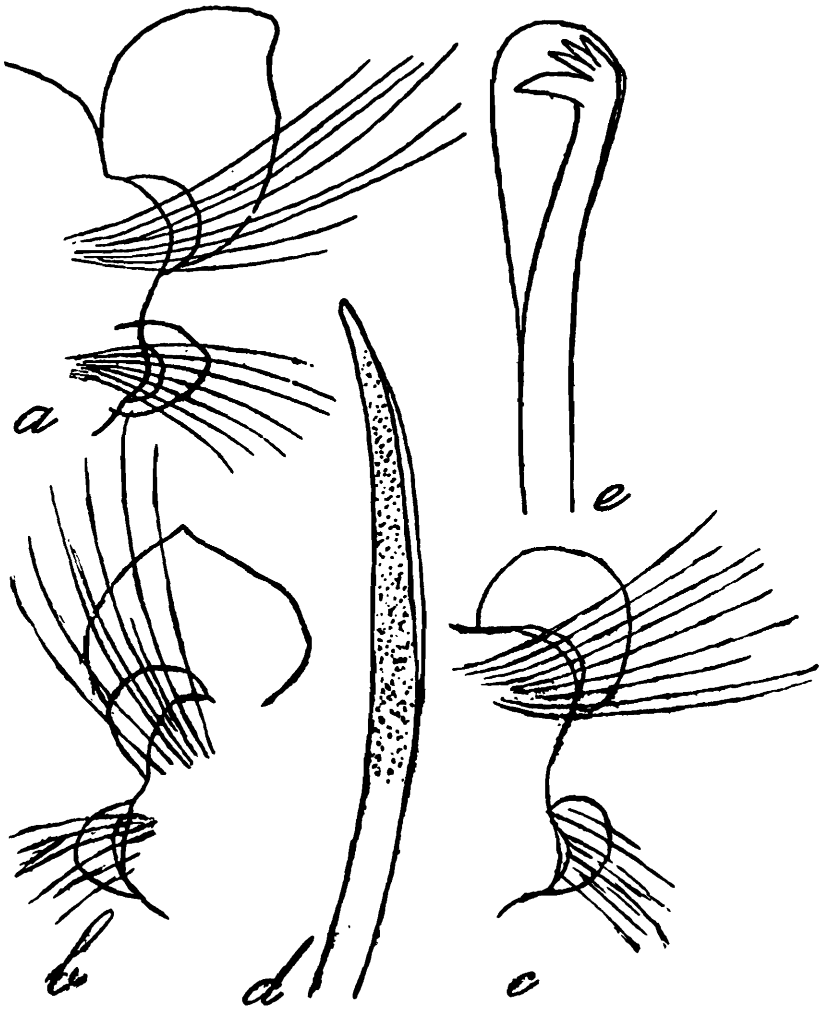

Fig. 171.—*Prionospio krusadensis* Fauvel: *a, b, c*, 6th, 15th, 20th feet ×120; *d*, bristle from the 10th setigerous segment ×400; *e*, ventral hook from the 18th setigerous segment.

Two clusters of 4—5 small eyes. First setigerous segment with both rami obsolete and only dorsal setae (?). Branchiae three pairs, on the second, third and fourth setigerous segments; *they are all pinnate*, the third pair often smaller. On the anterior segments, the dorsal lamellae are large, oval, or sub-triangular, the 5—6 first ones subequal, the 4th often larger. The following lamellae are lower, more rounded or heart-shaped, gradually decreasing in size, but still conspicuous to the end of the body. Ventral lamellae smaller, at first oval, next rounded and

then very small. No noteworthy transverse ridges. In the anterior region dorsal and ventral setae long and capillary. In 3—4 segments, from the 10th setigerous, on the ventral ramus a large golden seta, curved and dotted. From the 17th—18th setigerous segment ventral hooks with 3 teeth above the main fang. Dorsal hooks from the 40th—42nd setigerous segment. *There are no genital pouches.* A median anal cirrus and two very small others.

Length: about 20 mm. by 0.7—0.8 mm.

Colour: yellowish in alcohol.

Occurrence: Gulf of Mannar, Krusadai Island.

Family **DISOMIDAE** Mesnil.

Prostomium with two long tentacle-like palps. Feet biramous (at least in the anterior region). Setae of various kinds. Acicular setae. Dorsal and ventral cirri elongated or frilled. Body not clearly divided into regions.

Genus **DISOMA** Oersted.

No median frontal tentacle, and nuchal organ without three tentacular lobes. Dorsal cirri fleshy, rounded, with a frilled or smooth border.

314. **Disoma orissae** Fauvel. (Fig. 172, *a—m*)

Disoma orissae, Fauvel, 1932, p. 174, fig. 29, *a—m*.

Prostomium elongated, slightly notched in front, bulging in the middle and ending behind in a crest reaching to the 2nd setigerous segment. On the raised part, four very small eyes, two dorsal and two lateral, and a small erect, tapering, median tentacle. On each side, at the base of the prostomium, a small projecting nuchal organ. On the first setigerous segment a large lanceolate, subulate, dorsal cirrus and a ventral one directed forwards; a small bundle of capillary setae in front of the dorsal cirrus, and a fan-shaped ventral bundle of much longer setae extending beyond the prostomium. On the 2nd setigerous segment dorsal and ventral cirri, triangular, much smaller than the first ones, and ventral setae of two types: (1) an anterior row of very fine capillary setae and (2) a posterior transverse row of stouter shorter bristles with blunt curved tips. *Dorsal setae absent.* On the 3rd setigerous segment, a large lanceolate, chopper-like, dorsal cirrus, a crescentic tip, a triangular ventral cirrus, smaller than the dorsal one, a small ligule under the ventral cirrus and, in

front of the parapodial lamella, a vertical row of 7 stout yellow acicular setae with blunt bent tips, an anterior row of slender capillary setae and, in front of the cirrus, a diverging fascicle of dorsal capillary setae. In short, the ventral setae of the second foot are shaped like those on the third, but the acicular bristles are smaller, paler and more hyaline. Between the third and fourth foot, a deep triangular notch on each side of the body divides the anterior part from the following region in which the first 6–7 segments are much larger than the others; as a result,

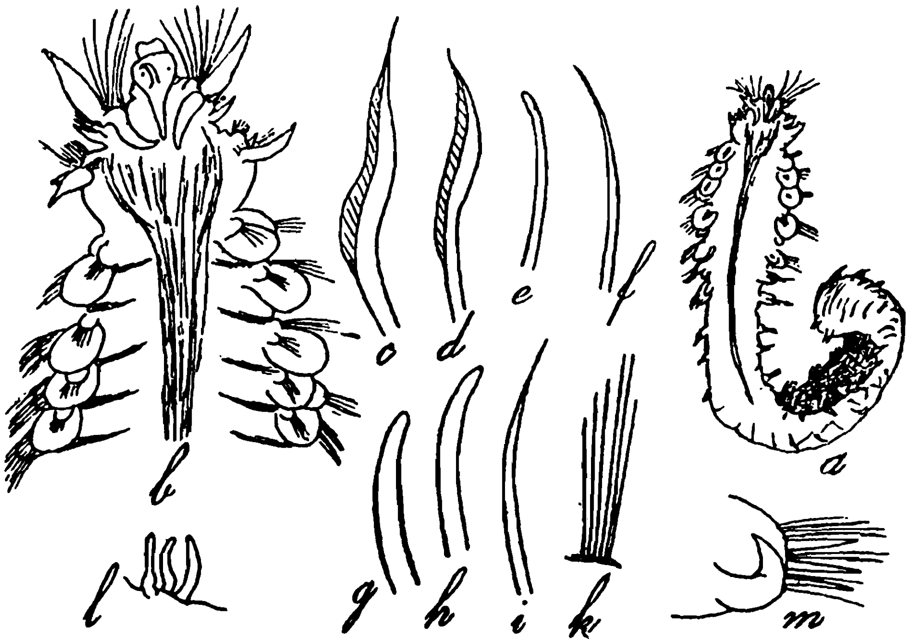

Fig. 172.—*Disoma orissae* Oersted: *a* ×7; *b,* anterior end, dorsal view ×22; *c, d,* winged bristles from the 6th setigerous segment ×110; *e,* ventral stout bristle from the 2nd segment ×110; *f,* ventral capillary seta from the 2nd segment ×110; *g, h,* stout bristles from the 3rd segment ×110; *i,* capillary seta from the 3rd segment ×110; *k,* fine dorsal setae from the 3rd segment ×110; *l,* abdominal papillae ×48; *m,* posterior foot with bodkin and capillary setae ×48.

this region is enlarged and flattened. On the 4th setigerous segment, the first of the enlarged part though smaller than the next, the dorsal and ventral cirri are thick, rounded lamellae, and there is a bundle of dorsal and ventral setae. The condition is the same in the succeeding four segments, but the ventral bristles are large, stout, yellow, set brush-like, as in *Aricia,* and of two kinds: (1) stout, doubly curved, nearly sickle-shaped, with a broad wing showing a tendency to split into fine spines, (2) capillary, similar to the dorsal ones. The dorsal setae disappear about the 11th foot. From the 9th segment backwards the dorsal cirri become filiform and the ventral ones are modified about the 12th–13th feet. Beyond the

11th foot long filiform ventral papillae make their appearance, a single one at first under each foot, but increasing to 2, 3, or 5. From the 9th foot backwards, the ventral setae are of two kinds: (1) stout, straight, bodkin-shaped, and (2) very slender capillaries.

Length: about 6 mm. by 1 mm. 25 segments, incomplete behind.

Discoloured, in spirit.

Occurrence: Off Puri, Orissa, 4—4½ fms.

Family MAGELONIDAE Cunningham and Ramage.

Body filiform divided into two regions. Prostomium oval, flattened, without tentacles. Two long papillated palps. A big proboscis. Parapodia biramous. Dorsal and ventral cirri lamelliform. Gills absent. Setae simple capillaries, or hooded hooks. Anal cirri.

Genus MAGELONA O. F. Müller.

Anterior and posterior region separated by a peculiar segment. Prostomium broadly oval, spatulate. Proboscis globular. Two long palps with sucker papillae.

315. **Magelona** sp. juv.

Monro, 1937, p. 299, fig. 19.

Monro's specimen from the Maldives is a post-larva too young for its attribution to any of the known species of *Magelona*.

Magelona rosea Moore has been recorded from the Gulf of Siam; *M. obokensis* Gravier, from the Red Sea, and *M. pacifica* Monro from the Pacific Ocean (Galapagos Islands).

Family CIRRATULIDAE Carus.

Body stout, subcylindrical, tapering at both ends. Prostomium without palps and tentacles. Peristomium ringed. Stout tentacular cirri (palps) inserted on the dorsal side of an anterior segment. Long slender simple gills inserted above the dorsal ramus. Feet biramous, both rami low and far apart. Capillary simple setae and simple acicular hooks. Dorsal and ventral cirri absent.

Key to the genera of CIRRATULIDAE.

1. Tentacular filaments numerous. Stout palp-like tentacular cirri absent	2
One pair of stout large palps .	3

2. Tentacular filaments beginning on the same segment as the gills ..	*Cirratulus* Lamarck, p. 332.
A few segments with lateral gills in front of the tentacle-bearing segment	*Audouinia* Quatrefages, p. 330.
3. Capillary setae and hooks	*Dodecaceria* Oersted, p. 835.
Capillary setae only ..	*Tharyx* Webster and Benedict, p. 334.
Acicular setae on both rami	*Heterocirrus* Grube, p. 334.

Genus AUDOUINIA Quatrefages.

Lateral gill filaments from the first segments to nearly the last ones. Tentacular cirri numerous, as slender as the gills, and set in two clusters on 1—2 segments farther back than the first gill-bearing ones. Capillary setae and hooks in both rami.

Key to the species of Audouinia.

1. Tentacular cirri on the 3rd setigerous segment. Segments ringed with black	*semicincta* (Ehlers), p. 330.
Tentacular cirri on 4th—5th or 5th—6th segments ..	2
2. Distance between the point of gill insertion and the dorsal ramus shorter than the distance between both rami. 4—5 hooks in each ventral ramus ..	*ancylochaeta* (Schmarda), p. 332.
Distance between the point of gill insertion and the dorsal ramus greater than the distance between both rami: 1—4 ventral hooks	*filigera* (Delle Chiaje), 331.

316. Audouinia semicincta (Ehlers). (Fig. 174 *c*).

Audouinia semicincta, Fauvel. 1923f, p. 42; 1930b, p. 542; 1935, p. 539.
(?) *Audouinia saxatilis,* Gravier, 1906, p. 154, pl. I, figs. 180—182.
Cirratulus semicinctus, Ehlers, 1905, p. 290, pl. IX, figs. 11—14.

Gills from the first setigerous segment. Tentacular cirri in two clusters on the 3rd or 4th setigerous segments. In the middle region of the body the distance between the gills and the dorsal ramus is equal to the distance between both rami. Capillary setae in every foot. Dorsal and ventral hooks alike and slender.

Length: 15—30 mm.

Colour: Body streaked with transverse lines of black dots. Tentacular cirri alternately ringed black and white.

Occurrence: Corbyn's Cove, Andaman Islands.

Distribution: Honolulu, Gambier Islands, New Caledonia, Gulf of Siam; Andaman Islands; Red Sea.

317. **Audouinia filigera** (Delle Chiaje). (Fig. 173, *h—l*).

Audouinia filigera, Fauvel, 1927a, p. 92, fig. 32, *h—m*; 1932, p. 178.
Cirratulus cylindricus Schmarda, Willey, 1905, p. 294, pl. VI, figs. 139—140.

Gills from the first setigerous segment. Tentacular cirri in two dense clusters inserted on the 4th—5th or the 5th—6th setigerous segments. Capillary setae in every

Fig. 173.—*Cirratulus cirratus* O. F. Müller: *a*, natural size; *b*, anterior part, tentacular cirri cut off ×3; *c*, section of mid-body ×5; *d*, foot ×36; *e, f*, dorsal and ventral hooks of a posterior foot ×48; *g*, dorsal capillary bristle ×48. *Audouinia filigera* (Delle Chiaje); *h*, anterior part ×2; *i*, section of mid-body ×3; *k*, dorsal hook ×120; *l*, ventral hook ×120. *h*, (on the left): *Cirratulus filiformis* Kef.

foot. Dorsal and ventral hooks present, except in the anterior segments. Ventral hooks few, 1—3, 3—4, and stout. Distance from point of gill-insertion to the feet greater than the distance between the two rami.

Length: 100—200 mm. by 4—5 mm.

Colour: Dark orange or brown in life. Very dark, or discoloured, in spirit.

Occurrence: Mergui Archipelago, Paway Island; Ceylon; Rameswaram Island; Palan Bidang, Cape Comorin.

Distribution: Pacific, Indian and Atlantic Oceans.

318. Audouinia anchylochaeta (Schmarda)

Audouinia ancylochaeta, Fauvel, 1930b, p. 541, 1932, p. 178.
Cirratulus anchylochaetus, Schmarda, 1861, p. 58; Augener 1914, p. 53 (Synonymy).
Timarete ancylochaeta, Ehlers, 1904, p. 53.
(?) *Timarete fecunda*, Kinberg, 1857—1910, p. 64, pl. XXV, fig. 1.

Gills from the first setigerous segment. Tentacular cirri inserted in two clusters on the 5th—6th setigerous segments. Capillary setae in every foot. Dorsal and ventral hooks 2—4 in each ramus, rather slender. Distance between point of gill insertion and the dorsal ramus shorter than the distance between both rami. Closely allied to *A. tentaculata*, if not conspecific.

Length: 100—200 mm. by 4—5 mm.

Colour: deep yellow, or red-brown, or greenish-brown, with red gills, in life.

Occurrence: Persian Gulf.

Distribution: Australia, New Zealand, New Caledonia; Persian Gulf.

Genus CIRRATULUS Lamarck.

Body long, cylindrical. Prostomium conical. First three segments achaetous. Lateral gills from the first setigerous segments to the hind part. Tentacular filaments nearly as slender as the gills and beginning on the same segment. Capillary setae and acicular hooks.

Key to the genus Cirratulus.

1.	Only capillary setae	2
	Capillary setae and hooks	3
2.	Gills and tentacles on the first setigerous segment ..	*filiformis* Keferstein, p. 333.
	Gills and tentacles on the 4th—5th setigerous segment	*chrysoderma* Claparède, p. 333.
3.	Gills and tentacles on the first setigerous segments ..	*cirratus* O. F. Müller, p. 334.
	Gills and tentacles on the 2nd setigerous segment	*dasylophius* Marenzeller, p. 333.

319. Cirratulus filiformis Keferstein. (Fig. 173, *h*).

Cirratulus filiformis, Fauvel, 1927a, p. 94, fig. 33, *h—i;* 1930a, p. 43: Monro, 1937, p. 301.

Body long, slender. Prostomium pointed, eyeless. On the first segment one pair of gills and 1—2 pairs of tentacles, hardly stouter. Capillary setae on both dorsal and ventral rami. *No hooks.*

Length: 30—40 mm. by 0.5—1 mm.

Colour: yellowish, or greenish-yellow.

Occurrence: Gulf of Mannar; Pamban; Maldive Archipelago.

In rock clefts and dredgings.

Distribution: Indian Ocean, Persian Gulf; Atlantic Ocean, Mediterranean Sea.

320. Cirratulus chrysoderma Claparède.

Cirratulus chrysoderma, Fauvel, 1927a, p. 95; 1930, p. 43.

Body slender. Prostomium triangular, eyeless. Gills and tentacles begin on the 4th setigerous segment. Gills on the anterior half of the body only. Only two pairs of tentacles. Gills inserted just above the dorsal ramus. Only long capillary setae on both rami. No hooks.

Length: 20—70 mm. by 0.5—3 mm.

Colour: greenish.

Occurrence: Gulf of Mannar; Pamban.

Distribution: Japan, Malayan Seas; India, Persian Gulf; Mediterranean Sea.

321. Cirratulus dasylophius Marenzeller.

Cirratulus dasylophius, Marenzeller, 1879, p. 146, pl. VI, fig. 5: Fauvel, 1911, p. 411.
(?) *Cirratulus complanatus,* Willey, 1905, p. 294.

Prostomium triangular, eyeless. On the second setigerous segment one pair of gills and one pair of tentacular cirri; on the third and fourth segments one pair of gills and numerous tentacles: thence one pair of gills only and no tentacles on every segment. Capillary setae and hooks in both rami, with the exception of the first setigerous segment, in which hooks are wanting. Ventral hooks stouter than the dorsal. First dorsal hooks about 43rd, ventral hooks from 29th setigerous segment.

Occurrence: Persian Gulf; Ceylon (?).

Distribution: Japan; Indian Ocean, Persian Gulf.

322. **Cirratulus cirratus** O. F. Müller. (Fig. 173, *a–g*).

Cirratulus cirratus, Fauvel, 1927a, p. 94, fig. 33, *a–g;* 1919, p. 427; 1939. p. 346.

Body cylindrical, Prostomium blunt-conical, on each side an oblique row of 4–8 large black eyes. Gills and tentacles on the first setigerous segment. The gills persist to the hind part of the body. 2–8 pairs of slightly stouter tentacles. Dorsal and ventral capillary setae on all the feet. Dorsal and ventral acicular setae, with the exception of a number of anterior segments.

Length: 30–120 mm. by 1.5–3 mm.

Colour: yellow-orange, red or brown.

Occurrence: Persian Gulf. In muddy sand.

Distribution: Japan; Indochina; Persian Gulf; Atlantic Ocean, Arctic Ocean and Antarctic Ocean, Kerguelen, Falkland Islands, Cape Horn.

Genus THARYX Webster and Benedict.

Body cylindrical, slender, elongate. Peristomium and the two succeeding segments achaetous. Prostomium conical. Lateral gills on a number of anterior segments. One pair of stout dorsal palps and one pair of gills on the first setigerous segment. Dorsal and ventral rami little remote. Capillary setae only.

323. **Tharyx multifilis** Moore.

Tharyx multifilis, Moore, 1909, p. 267, pl. IX, fig. 43: Fauvel, 1932, p. 179.

Prostomium long, sharply conical, eyeless (?). Gills absent on about the last 20 segments. Dorsal setae longer than the ventral ones.

Occurrence: Madras.

Distribution: San Diego, California; Madras.

Genus HETEROCIRRUS Grube.

Prostomium conical. Two stout dorsal palps and one pair of gills before the first setigerous segment. A number of lateral gills. Capillary setae and hooks.

324. **Heterocirrus typhlops** Willey. (Fig. 174, *d*).

Heterocirrus typhlops, Willey, 1905, p. 295, pl. V, fig. 138.

" A very small worm, total length 10.5 mm., diameter less than half a millimetre. Capillary non-limbate setae in both fascicles; dorsal and ventral acicular setae com-

mence on the first setigerous segment; they resemble those of *Cirratulus;* the ventral acicular setae are two in number, more curved and thicker than the dorsal." "The disposition of such cirriform appendages as remain are inserted laterally over the feet." (Willey)

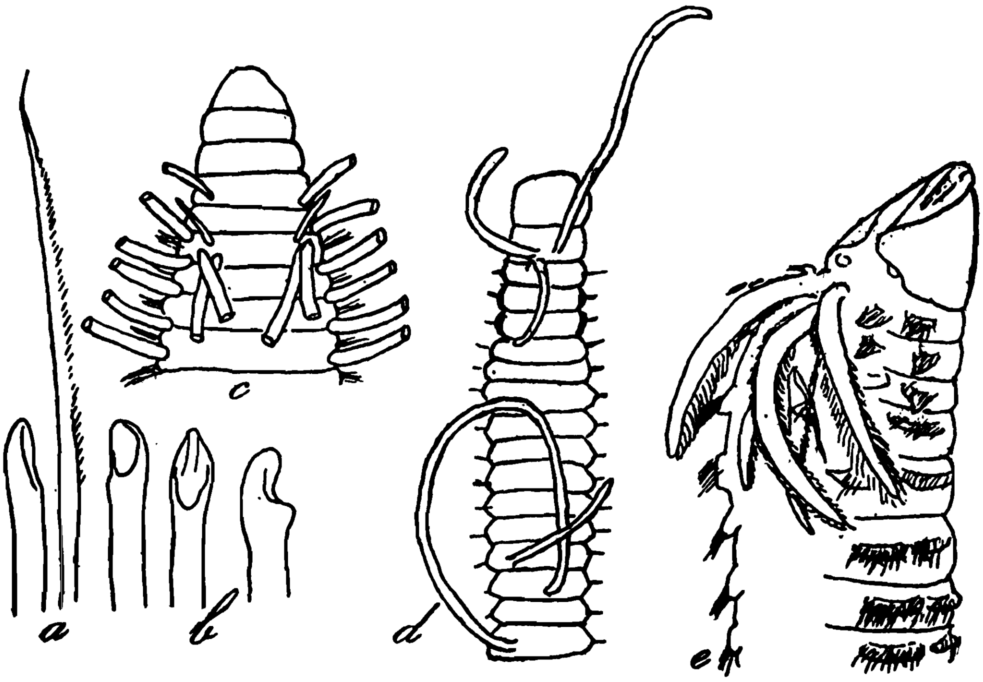

Fig. 174.—*Dodecaceria fistulicola* Ehlers: *a,* capillary bristle and anterior hook ×570; *b,* posterior hooks ×570 (after Ehlers). *Audouinia semicincta* (Ehlers): *c,* anterior part (after Gravier). *Heterocirrus typhlops* Willey: *d,* anterior part, (after Willey). *Prionospio pinnata* Ehlers: *e,* anterior part, side view (after Caullery)

Occurrence: Southwest Cheval Paar, Gulf of Mannar. Willey's description and figures hardly agree with *Heterocirrus.*

Genus DODECACERIA Oersted.

Body stout. Prostomium blunt, generally eyeless. Peristomium achaetous, triannulate, with two stout palps. Tentacular filaments absent. 4—15 pairs of gills. All setae simple. Dorsal and ventral capillary setae. Spoon-shaped hooks on both rami, with the exception of the anterior region.

325. **Dodecaceria fistulicola** Ehlers. (Fig. 169, *h, i;* Fig. 174, *a, b*).

Dodecaceria fistulicola, Ehlers, 1901, p. 186, pl. XXV, figs. 5—9: Fauvel, 1930, p. 543; 1935, p. 340.

Dodecaceria joubini, Gravier, 1906, p. 156, pl. I, figs. 183—184.

(?) *Dodecaceria opulens,* Gravier, 1909, p. 643, pl. 17, figs. 39—45: Fauvel, 1930a, p. 44.

Body flattened posteriorly. Prostomium bluntly conical. Two stout grooved palps, 5 pairs of large gills and 2–3 other pairs, much more slender. Capillary setae. Large spoon-shaped hooks with a swelling at the back of the cavity which, seen in profile, looks like a blunt lateral tooth. Anterior and dorsal hooks more slender.

Length: 15–25 mm.

Colour: black coloured, or very dark brown.

Occurrence: Pamban, Gulf of Mannar.

Distribution: Coast of Chile, Australia, New Caledonia, Annam; India, Red Sea?.

Remarks: *Dodecaceria fistulicola* Ehlers, *D joubini* Gravier and *D. opulens* Gravier are three very closely related species, and may be only varieties. Ehlers' denomination has priority.

Family CHAETOPTERIDAE Aud. and M.-Edw.

Body soft, divided into two or three regions. Prostomium little conspicuous. Mouth terminal, no extrusible proboscis. Two or four tentacles (palps and tentacular cirri). Anterior region of a few uniramous segments; middle region, when present, with biramous highly specialised segments; posterior region of numerous biramous segments, all of them similar. Dorsal setae capillary or lanceolate. In the fourth setigerous segment peculiar stout spines. Ventral setae pectinate uncini. Tube horny, more or less ringed, translucent, or opaque parchment-like.

Key to the genera of CHAETOPTERIDAE.

1. One pair of tentacles — 2
   Two pairs of tentacles. Tube cylindrical, horny, ringed — *Phyllochaetopterus* Grube, p. 338.

2. Two or three median segments. A dorsal continuous ciliated groove. Notopodia all conical — *Mesochaetopterus* Potts, p. 342.
   Five median segments. No continuous ciliated groove. Median notopodia fused to form fans or suckers .. *Chaetopterus* Cuvier, p. 337.

Genus CHAETOPTERUS Cuvier.

Body of large size, thick, soft, divided into three distinct regions. Two small filiform palps (tentacles) Anterior region with uniramous feet and oar-shaped setae. Stout modified bristles on the 4th setigerous segment. Middle region of 5 biramous segments, the first with two aliform appendages, the next with dorsal rami cup-shaped and the others paddle-shaped. Ventral rami coalescent, bearing pectinate uncini. Posterior region with dorsal rami unilobed; ventral rami bilobed, uncinigerous. Tube consisting of layers of parchment-like membranes.

326. **Chaetopterus variopedatus** Renier. (Fig. 175, *a—n*)
n)

Chaetopterus variopedatus, Fauvel, 1927a, p. 77, fig. 26, *a—n* (Synonymy); 1932, p. 176: Pruvot, 1930, p. 76.

Chaetopterus cautus, Marenzeller, 1879, p. 143, pl. VI, fig. 5.

Chaetopterus appendiculatus Grube, Willey, 1905, p. 291, pl. V, fig. 126.

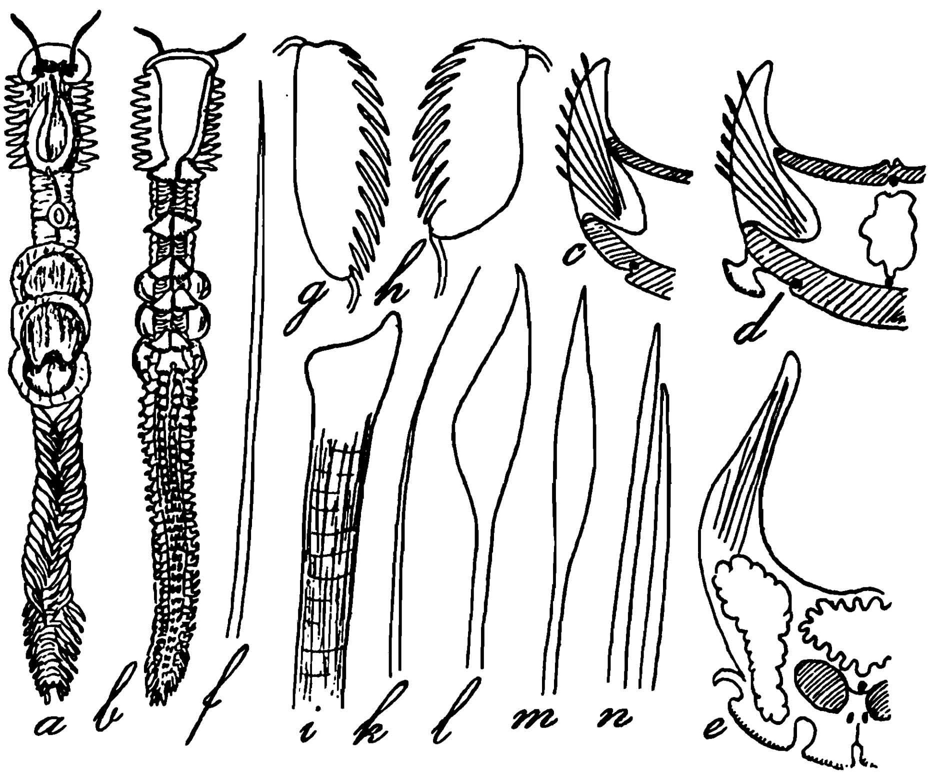

Fig. 175.— *Chaetopterus variopedatus* (Renier): *a, b,* dorsal and ventral view, reduced 1/3; *c,* foot of the 3rd thoracic segment; *d,* last thoracic foot; *e,* posterior foot (after Joyeux-Laffine); *f,* capillary seta of the dorsal ramus of the first segment of the mid-body region (wings) ×47 ; *g, h,* uncini ×310 ; *i,* stout bristle from the 4th segment ×23; *k,* thoracic capillary bristle ×60 ; *l, m,* thoracic lancet-shaped setae ×47 ; *n,* acicular bristles from the posterior feet ×23.

Chaetopterus longimanus, Crossland, 1904, p. 272, pl. XVIII, fig. 1–2.
Chaetopterus longipes, Crossland, 1904, p. 277, pl. XIX, fig. 1–2.

The specific characters are mainly those of the genus. It is very doubtful whether there is really more than one species, although many have been described, but the characters used to discriminate them are of very little value. Specimens exhibit a great deal of variation which is probably a result of frequent autotomy, followed by more or less complete regeneration; individual specimens also present an extensive range of variation, for instance, the characters given by Crossland as distinctive of *Ch. longimanus* are often met with in *Ch. variopedatus* from the Atlantic Ocean and English Channel. *Ch. longipes* is only a young form of the same. The number and size of the anterior segments vary to a very large extent, as also the length of the feet.

Length: 150–250 mm. by 15–25 mm.

Colour: in life, greenish-yellow or whitish-yellow. Median region partly black. Phosphorescent.

Occurrence: Mergui Archipelago; Ceylon; Maldive Archipelago.

Distribution: Pacific, Indian and Atlantic Oceans. Cosmopolitan.

Genus PHYLLOCHAETOPTERUS Grube.

Body slender, divided into three regions. Two long tentacles (palps) and two small posterior tentacles. Anterior region with uniramous feet bearing oar-shaped setae. One or more large peculiar spines on the 4th setigerous segment. Middle region with a number of biramous feet, dorsal rami foliaceous, lateral branchial lobes, and ventral rami bilobed. Posterior region with biramous feet, dorsal rami cylindrical; ventral rami uncinigerous. Tube horny, translucent, cylindrical, more or less ringed. Schiziparous reproduction frequent.

Key to the species of Phyllochaetopterus.

1.	Middle region of two segments ..	2
	Middle region of numerous segments	3
2.	Glandular cirri on the first segment of the middle region	*aciculigerus* Crossland, p. 341.

No glandular cirri on the first segment of the middle region	*herdmani* Willey, p. 342.
3. A single spine on the 4th segment ..	*socialis* Claparède, p. 339.
Several spines on the 4th segment	4
4. Large size	*gardineri* Crossland, p. 341.
Small size ..	*elioti* Crossland, p. 340.

327. Phyllochaetopterus socialis Claparède. (Fig. 176, *a—l*).

Phyllochaetopterus socialis, Fauvel, 1927a, p. 84, fig. 30, *a—l*; 1932, p. 177.

Phyllochaetopterus pictus, Crossland, 1903, p. 174, pl. XVI, figs. 5—9.

(?) *Phyllochaetopterus ramosus*, Willey, 1905, p. 293, pl. V, figs. 133—136.

Two eyes. Anterior region 10—18 and more segments. Middle region 5—28 segments. Posterior region, numerous segments. *On the fourth setigerous segment a single large modified spine,* obliquely truncate at the tip. Rami

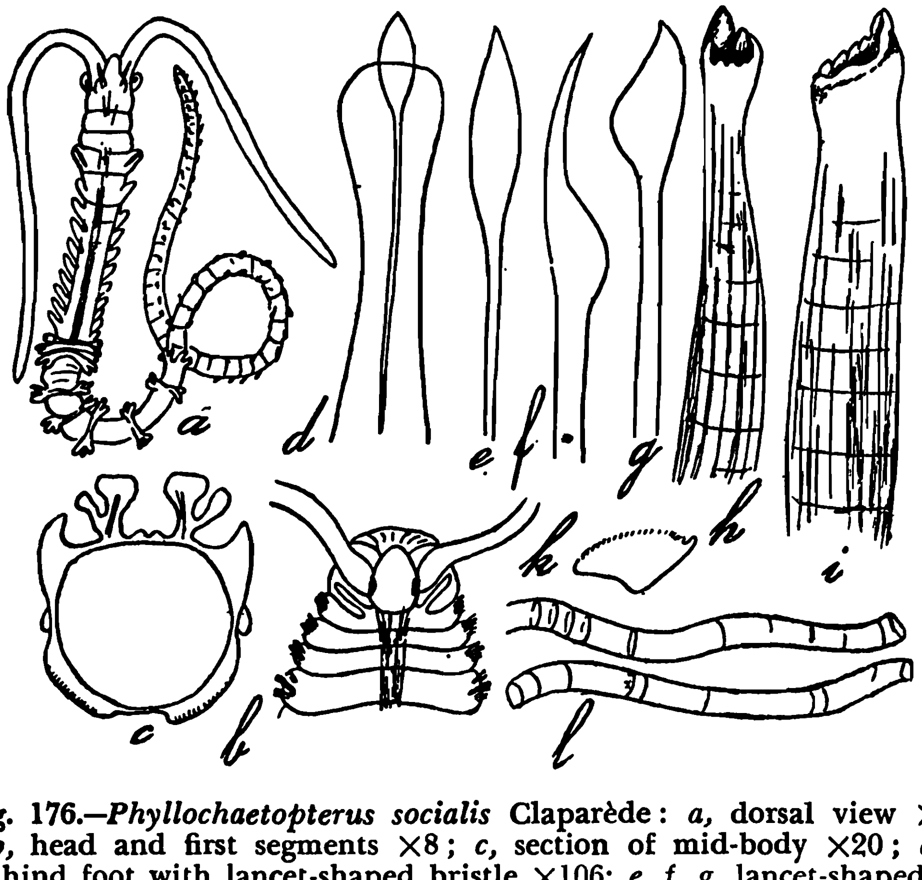

Fig. 176.—*Phyllochaetopterus socialis* Claparède: *a*, dorsal view ×4; *b*, head and first segments ×8; *c*, section of mid-body ×20; *d*, hind foot with lancet-shaped bristle ×106; *e, f, g*, lancet-shaped and knife-shaped bristles of the thoracic feet ×106; *h-i*, stout bristle from the 4th setigerous segment ×62, 106; *k*, uncinus ×390; *l*, tubes ×2.

of the posterior region with one, rarely two, lanceolate setae. Horny tubes ringed, simple or branched.

Length: 20–40 mm. by 1–2 mm.

Colour: yellowish, with brown-reddish spots on the anterior region and tentacles.

Occurrence: Chandipore, near Balasore, Orissa; Ceylon; Bombay; Arabian Sea, Maldive Archipelago, Gulf of Oman.

Distribution: Australia; Indian Ocean; Atlantic Ocean, Mediterranean Sea, Falkland Islands.

328. **Phyllochaetopterus elioti** Crossland. (Fig. 177, *e–h*).

Phyllochaetopterus elioti, Crossland, 1903, p. 172, pl. XVI, fig. 1, 3, 8, pl. XVIII, fig. 10–13; Fauvel, 1930a, p. 41.

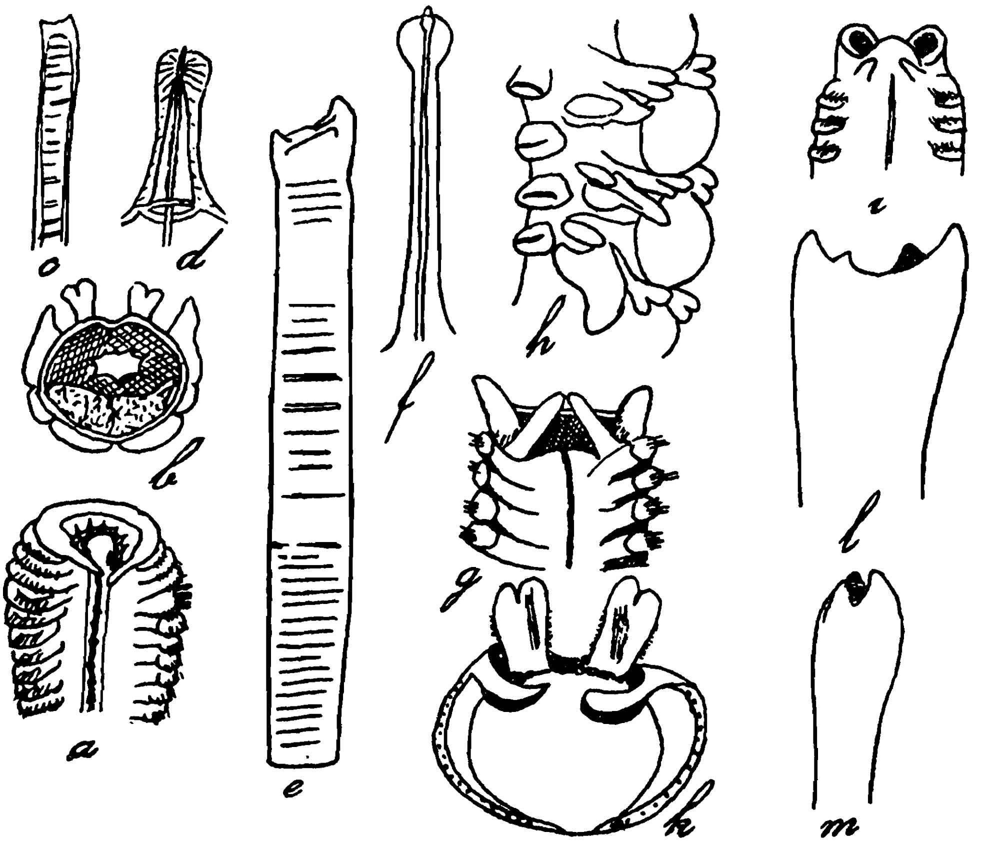

Fig. 177.—*Phyllochaetopterus gardineri* Crossland: *a*, anterior part, dorsal view ×3; *b*, section of a segment of the 2nd region ×3; *c*, short bristle from the 4th setigerous segment ×47; *d*, clavate dorsal foot from the posterior region ×47. *Ph. elioti* Crossland: *e*, stout bristle from the 4th setigerous segment ×66; *f*, foot of the posterior region ×66; *g*, head ×6; *h*, side view of the 3rd segment of the middle region ×6 (after Crossland). *Ph. herdmani* Willey: *i*, anterior end; *k*, a branchial segment; *l*, stout bristle from the 4th foot; *m*, modified seta from the 3rd foot of an aberrant individual (after Willey).

Two eyes. Anterior region of about 14 segments; middle region 20—25 segments; posterior region numerous segments. On the fourth foot, 2—3 stout cylindrical setae which are not noticeably curved. *A single lanceolate seta in posterior dorsal rami.* Tubes straighter, larger, more opaque than those of *P. socialis* Claparède, indistinctly annulated, more or less covered with sand grains.

Length: of tube 120—220 mm.

Colour: milk-white anteriorly, black posteriorly. Reddish spots restricted to the long palps.

Occurrence: Gulf of Mannar, Krusadai Island. Mixed with tubes of *Mesochaetopterus* and *Axiothella.*

Distribution: India, Zanzibar.

329. **Phyllochaetopterus gardineri** Crossland. (Fig. 177, *a—d*).

Phyllochaetopterus gardineri, Crossland, 1904, p. 280, pl. XIX, figs. 3—7.

Two eyes. Anterior region of 15 segments; middle region of 24; posterior, numerous segments. On the fourth setigerous segment 3 strong, straight, flattened, light brown setae. *Dorsal rami of the posterior region with one striated seta.* Tubes straight, occurring singly (?), 2.5 mm. broad.

Occurrence: Dredged off Minikoi Atoll, Maldive Archipelago.

Remarks: " This species is very closely related to *Ph. elioti.* It is readily separable, however, by its much larger size." (Crossland)

330. **Phyllochaetopterus aciculigerus** Crossland. (Fig. 178, *b—d*)

Phyllochaetopterus aciculigerus, Crossland, 1904, p. 278, pl. XVIII, figs. 3—7.

No eyes. Anterior region of 9 segments; *middle region of only two;* posterior region, numerous segments. On the fourth setigerous segment 8 thickened setae, of a brown colour, proximally strongly striated. *The first segment of the median region bears glandular ridges and two glandular cirri arching over the back;* the second segment lacks these glandular appendages. The dorsal rami of the posterior region are very small, conical, and contain about 9 long bent setae. Tube unknown.

Breadth: 7 mm.

Occurrence: Mamaduvari, South Mahlos Atoll, Maldive Archipelago. One specimen only.

Remarks: Closely allied to *Ph. major* Claparède.

331. **Phyllochaetopterus herdmani** Willey. (Fig. 177, *i—m*)

Phyllochaetopterus herdmani, Willey, 1905, p. 292, pl. V, figs. 127—132.

Anterior region of 9—10 segments; middle region of *only two segments;* posterior region, 40—50. On the fourth setigerous segment 8—9 modified, flattened setae. The first segment of the middle region bears neither glandular ridges nor glandular cirri. The dorsal rami of the posterior region carry a bundle of 4 spatulate setae. Narrow cylindrical tubes incrusted with relatively coarse sand grains and hard fragments of all kinds, including Foraminifera.

Occurrence: Ceylon, Galle shore; under stones.

Remarks: Closely related to *Ph. aciculigerus,* the absence of a pair of glandular cirri on the first segment of the middle region being the chief difference.

Genus MESOCHAETOPTERUS Potts.

A pair of long peristomial tentacles. Body divided into three regions, the anterior with 9—13 setigerous segments. In the fourth setigerous segment are several enlarged dorsal setae. In the median region, 2—3 elongated segments with continuous lateral borders and transverse ridges. Notopodia rather enlarged, conical and fleshy, with a groove running down the internal border; the neuropodia are simple in the first, double in the succeeding segment, or segments. In the posterior region, a large number of segments similar to those of *Chaetopterus,* but with much shorter notopodia. *A dorsal ciliated groove* runs from the mouth, along the median line, to the posterior end. In one or more of the median segments the lips are enlarged to form a fleshy organ.

332. **Mesochaetopterus minutus** Potts. (Fig. 178, *a*).

Mesochaetopterus minuta, Potts, 1914, p. 963, pl. II—III, figs. 7—8: Fauvel, 1930a, p. 41; Monro, 1928, p. 92; 1931, p. 25.
Spiochaetopterus spec., Gravely, 1927, p. 24.

" Very small, slender, living in tubes of a translucent, horny material, coated with coarse sand. Prostomium

large and conical. Peristomial collar well developed. Just external to the tentacles is a pair of eyes. The anterior region contains 10–13 segments, the median region is composed of two segments. The first pair of notopodia are small and clavate, the second pair are of the type

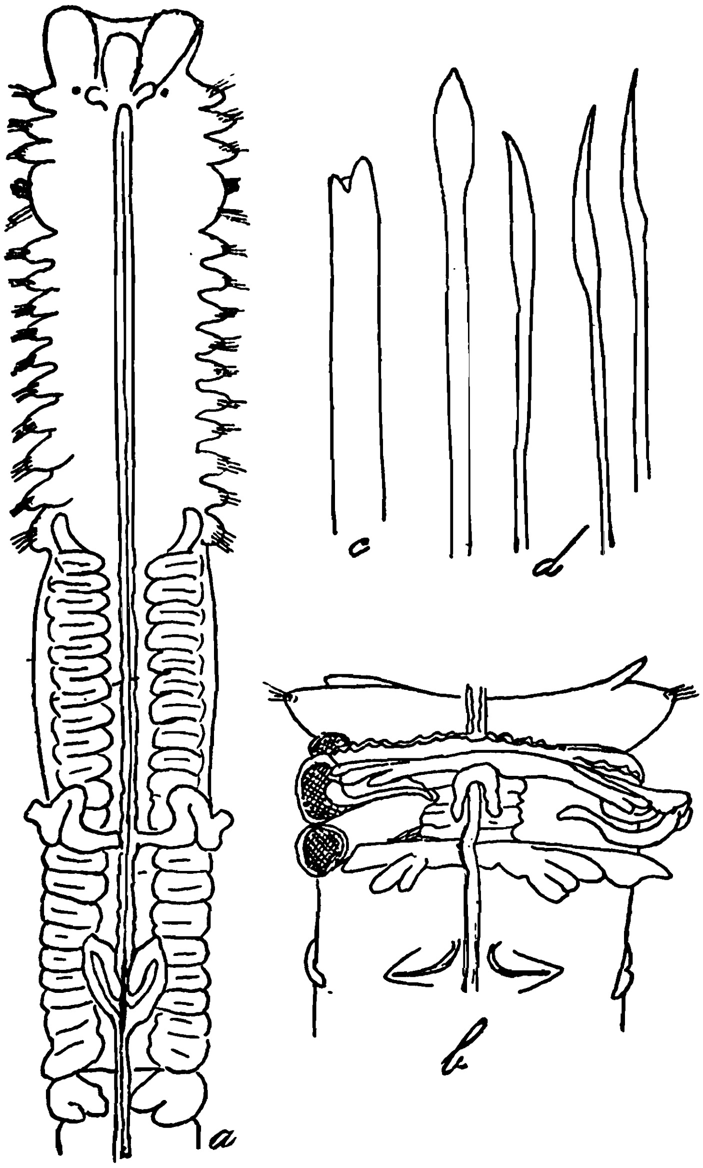

Fig. 178.—*Mesochaetopterus minutus* Potts: *a,* dorsal view ×13 (after Potts). *Phyllochaetopterus aciculigerus* Crossland; *b,* mid-body together with adjoining segments ×6; *c,* stout bristle from the 4th foot ×47; *d,* setae from the anterior region ×47 (after Crossland).

described for the genus. *The ciliated groove expands into a cup* in the middle of the second segment. The posterior region is composed of segments which are double anteriorly, simple posteriorly; each notopodium has a single seta." (Potts)

Length: 20 mm. by 1 mm.

Occurrence: Gulf of Mannar, Krusadai Island, edge of South Lagoon.

Distribution: Torres Strait, Great Barrier Reef; India; Atlantic Ocean, Cape Verde Islands; Panama.

Family CHLORAEMIDAE Malmgren.

Flabelligériens Saint-Joseph.

All segments nearly alike, short, papillose. Prostomium and buccal segment in the form of a retractile tube, with eyes, two stout palps and slender, retractile branchial filaments. The setae of the first segments are generally very long, directed forwards and forming a more or less marked cephalic cage. Parapodia biramous, rami far apart, generally without distinct setigerous processes. Dorsal setae simple, capillary, annulated or articulated. Ventral setae sigmoid, or hooked, or compound with sickle-shaped end-piece.

Key to the genera of CHLORAEMIDAE.

1. Ventral hooks compound. Body enclosed in a thick mucous sheath containing pedunculate papillae	*Flabelligera* Sars, p. 344.
Ventral hooks simple. Mucous sheath absent ..	2
2. A pair of elongated nephridial papillae on the ventral side	*Brada* Stimpson, p. 351.
Conspicuous nephridial papillae absent	3
3. Gills all similar ..	*Stylarioides* Delle Chiaje, p. 345.
Gills of two kinds	*Diplocirrus* Malmgren, p. 352.

Genus FLABELLIGERA Sars.

Body soft, short, transparent, enclosed in a thick mucous coating, containing long pediculate papillae. Dorsal setae capillary. Compound ventral hooks.

333. **Flabelligera diplochaitos** Otto. (Fig. 185, *g—o*)

Flabelligera diplochaitos, Fauvel, 1927a, p. 114, fig. 40, *g—o*: Monro, 1937, p. 304.

Buccal siphon short, with two groups of 40—50 slender green gills and two stout palps. Cephalic cage form-

ed by the four fascicles of the long setae of the first setigerous segment pointing forwards. Dorsal setae very long and annulated. Ventral hooks compound or semicompound, with faintly curved terminal piece. In each foot 4—6 hooks accompanied by a bundle of short, straight capillary, included, setae.

Length: 50—100 mm. by 10 mm.

Colour: Semi-transparent; blood green.

Occurrence: Arabian Sea.

Distribution: Arabian Sea; Atlantic Ocean, Mediterranean Sea.

Genus STYLARIOIDES Delle Chiaje.

Body elongated, more or less cylindrical or club-shaped, coated with papillae. Two stout palps. Gills filiform, often very numerous, all similar, inserted on a more or less long peduncle, retractile. A cephalic cage. Dorsal setae long, capillary, annulated. Ventral setae simple or rarely pseudo-compound; those beyond the first segments ending in a somewhat stout hook, sometimes bidentate. Acicular setae slender. Blood green.

Key to the Species of Stylarioides.

1. Ventral hooks absent	*hamocarens* Monro, p. 345.
Ventral hooks present	2
2. Ventral setae unidentate	3
Ventral setae bidentate	*eruca* Claparède, p. 347.
3. A kind of dorsal oval shield coated with sand	*parmatus* Grube, p. 346.
No such dorsal shield	4
4. Body slightly and gradually tapering posteriorly. Gills inserted on two flattened lobes	*bifidus* Fauvel, p. 349.
Body very slender and twisted in the posterior part. Gills inserted on a horse-shoe shaped membranaceous lobe ..	*bengalensis* Fauvel, p. 347.

334. Stylarioides hamocarens Monro. (Fig. 179, *a*)

Stylarioides hamocarens, Monro, 1937, p. 302, fig. 21.

Body dotted with small papillae incrusted with mud A well developed cephalic cage formed by the first three setigerous segments which are provided with pedal lobes

these lobes are absent over the rest of the body. In the next segment dorsal and ventral setae of this same type, but considerably smaller, striated and ending in fine flagelliform tips. *There is no trace of ventral hooks.* Gills

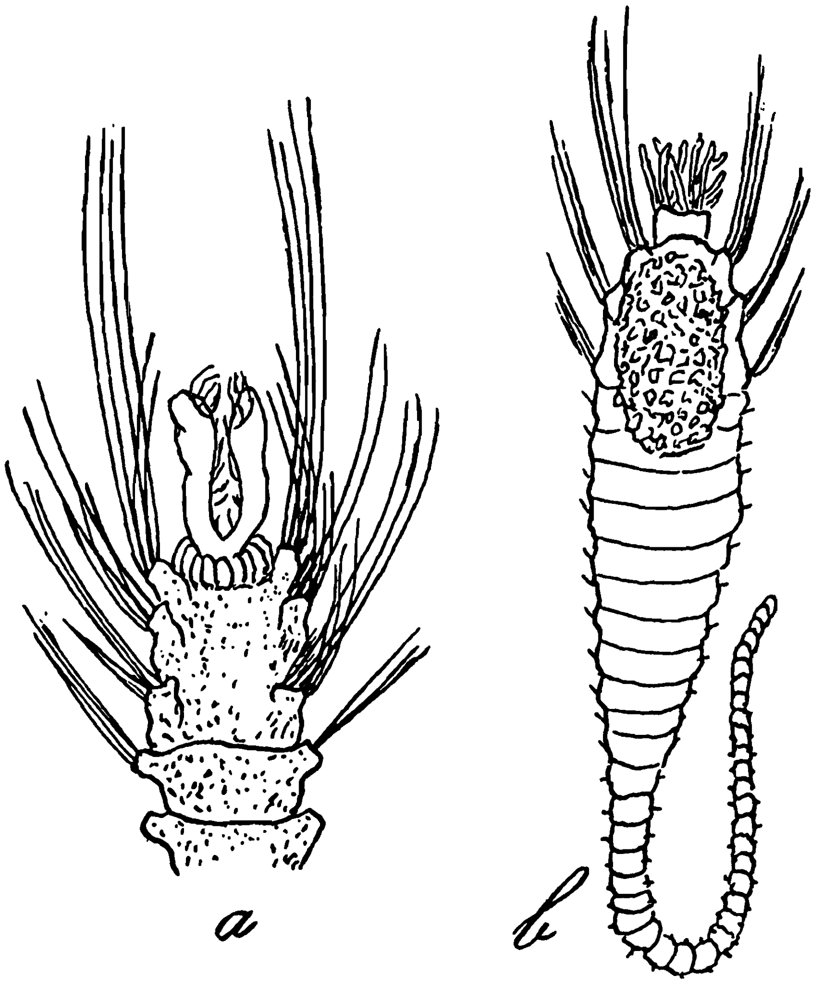

Fig. 179.—*Stylarioides hamocarens* Monro: *a*, anterior region, from above (after Monro). *Sty. parmatus* Grube: *b*, dorsal view, with shield.

numerous, filiform, borne on two separate, divergent, stout, membranous lobes, with their sides folded inwards. When unfolded, these lobes are more or less spoon-shaped in outline.

Length: 23 mm. by 3 mm.

Colour: in spirit, dark green in front, merging into yellow behind.

Occurrence: North Arabian Sea, 759—1024 m.

335. **Stylarioides parmatus** Grube. (Fig. 179, *b*)

Stylarioides parmatus, Grube, 1878, p. 199, pl. XI, fig. 1: Willey, 1905, p. 289, pl. VIII, fig. 5: Augener, 1926a, p. 180, fig. 5: Fauvel, 1930a, p. 42; 1932, p. 179.

Stylarioides iris, Michaelsen, 1892, p. 108, fig. 6.

Body much swollen anteriorly, abruptly tapering into a filiform tail, and bearing on the front part of the dorsum a kind of oval shield firmly coated with sand. Setae of the cephalic cage long, slender, iridescent, belonging to the 3 anterior segments. Skin papillae in circular rows.

Length: about 30 mm.

Occurrence: Madras; Ceylon.

Distribution: New Zealand; Philippine Islands; Madras, Ceylon, Madagascar.

336. **Stylarioides eruca** Claparède, var. **indica** Fauvel. (Fig. 170, *h—l*)

Stylarioides eruca, Fauvel, 1927a, p. 119, fig. 42, *h—l.*. (Synonymy).

Stylarioides eruca, var. *indica,* Fauvel, 1928, p. 93, fig. 3, *h—i;* 1930*a*, p. 42, fig. 10, *h—l,* 1932, p. 180.

Body subtetragonal, thickly coated with sand, segments clearly marked. Skin-papillae small, short, not arranged in regular longitudinal rows. 3—4 longer papillae behind each bundle of setae. Branchiae numerous, filiform, inserted on a short peduncle, deciduous. Cephalic cage formed by the setae of the first three setigerous segments, long, slender, not irridescent, and pointing forwards. In the third segment, the *ventral setae are already bidentate,* and shorter than the dorsal ones. In the following segments, the ventral setae vary in length but are all ringed, bent at the tip, with a long slender sub-rostral spine.

Length: 60 mm. by 3—4 mm. About 70 segments.

Occurrence: Nankauri Harbour (amongst corals); Gulf of Mannar, Krusadai Island.

Distribution: Indian Ocean (typical form; Atlantic Ocean, Mediterranean Sea).

Remarks: This variety differs from the type in having (1) shorter adhesive papillae, less numerous and less regularly arranged and (2) longer and more slender upper ventral setae.

337. **Stylarioides bengalensis** Fauvel. (Fig. 180, *a—f*)

Stylarioides bengalensis, Fauvel, 1932, p. 180, fig. 30, *a—f.*

Anterior part of the body cylindrical or club-shaped; posterior part abruptly tapering into a filiform coiled tail. Segments numerous and hardly distinct. Body covered with small globular papillae which do not firmly

retain the sand. Buccal tube very long and protrusible, cylindrical, frilled at the edge. Branchiae slender, filiform, very numerous, set in several rows on a membranous horse-shoe shaped branchial lobe with edges rolled as in Serpulids. Two canaliculate palps with sinuous edges. Mouth opening trilobed, the two ventral lobes larger than

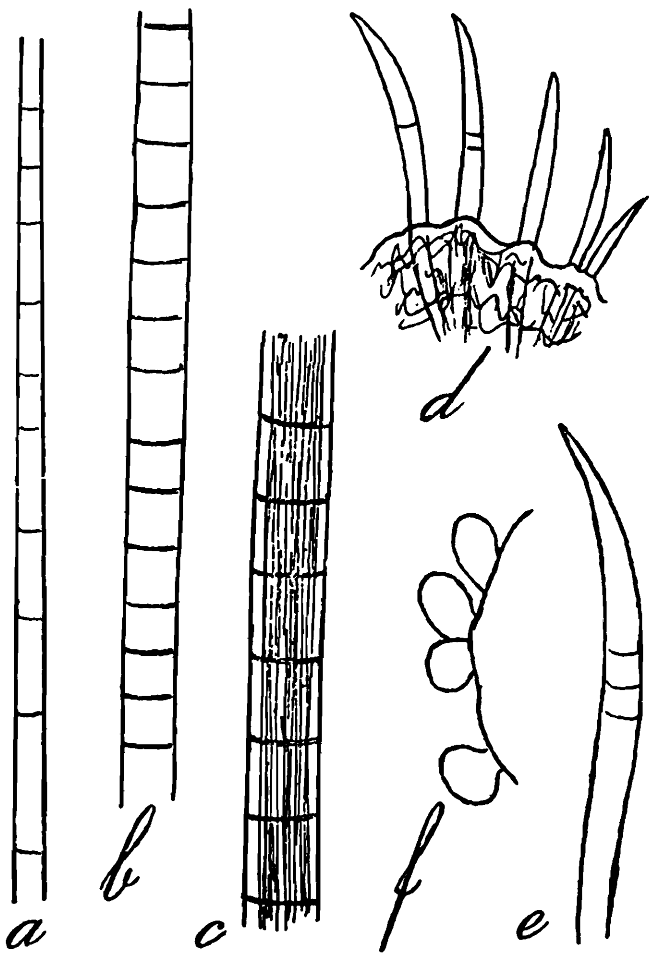

Fig. 180.—*Stylarioides bengalensis* Fauvel: *a, b,* base and tip of a dorsal seta ×380; *c,* part of a bristle of the cephalic cage ×380; *d,* ventral ramus ×45; *e,* ventral hook ×120; *f,* skin-papillae ×150.

the dorsal. Cephalic cage formed by the setae of the first three setigerous segments arranged in three close-set concentric circles. The setigerous lobes of the third foot are more protruding and less far apart. These bristles, 3 to 5 in each bundle, are very long and stout, ringed and beautifully iridescent. On the next three segments, very small and slender dorsal capillary setae and a few fine ventral capillaries. On the following segments sigmoid ventral hooks.

Length: about 60 mm. by 6–7 mm.

Colour: in spirit, whitish-grey under the thin coating of fine reddish ooze adhering to the skin-papillae.

Occurrence: Sandheads, River Hughli; Madras Coast.

338. **Stylarioides bifidus** Fauvel. (Figs. 181, *a, b;* 182, *a—e*).

Stylarioides bifidus, Fauvel, 1932, p. 182, fig. 31, pl. VII, figs. 15—16.

Body gradually tapering backwards, segments clearly marked. Skin-papillae rather short and well apart, cylindrical in the anterior region, nearly globular in the hinder part. The body is not coated with sand but with

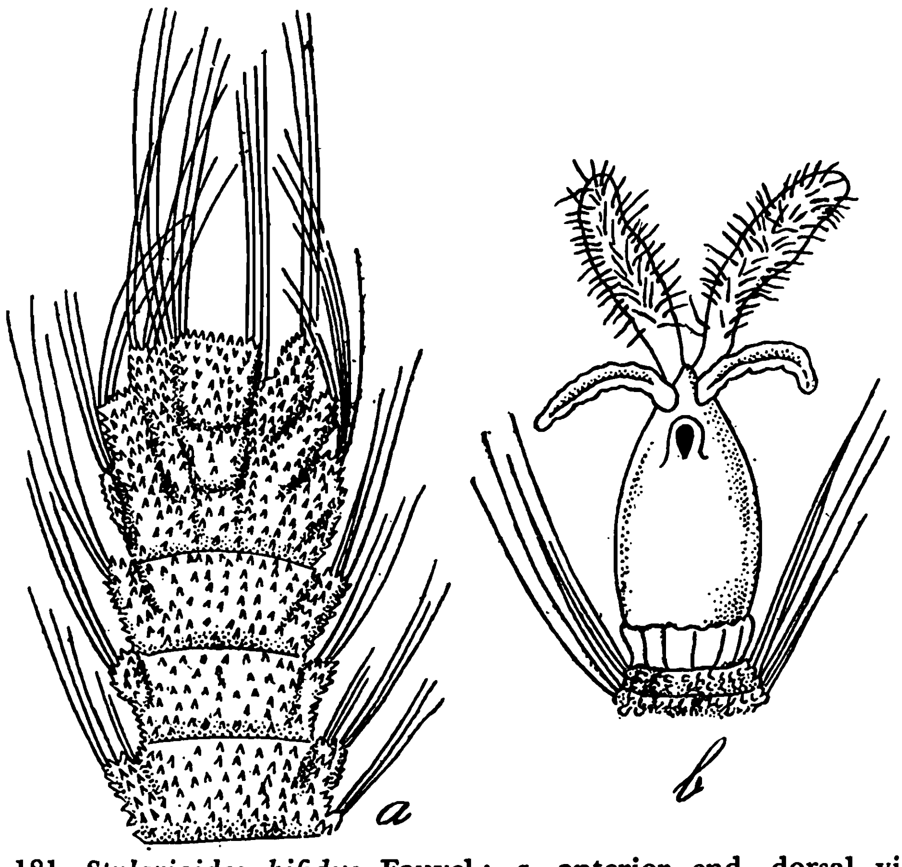

Fig. 181—*Stylarioides bifidus* Fauvel: *a,* anterior end, dorsal view, ×6; *b,* branchial apparatus protruded (semischematic). (From Fauvel 1932.)

fine ochraceous ooze. Buccal siphon ovate, with a delicate frilled membrane at the base ; mouth small, with two short, canaliculate, puckered palps behind. Gills very small, slender, very numerous, inserted on two flattened, elongated, diverging lobes, free from the base and without any connecting membranes. Cephalic cage formed mainly by the first three setigerous segments and partly by the two succeeding ones. The bristles of the cephalic

cage are long slender, articulate, hardly iridescent and few in the first three segments, in which the feet are stout, protruding and directed forwards. Both rami are close together, the ventral one slightly behind the other. The dorsal setae of the following 10—12 segments are long, capillary, ringed, directed forwards, gradually decreasing in length; the ventral setae are shorter and fewer and

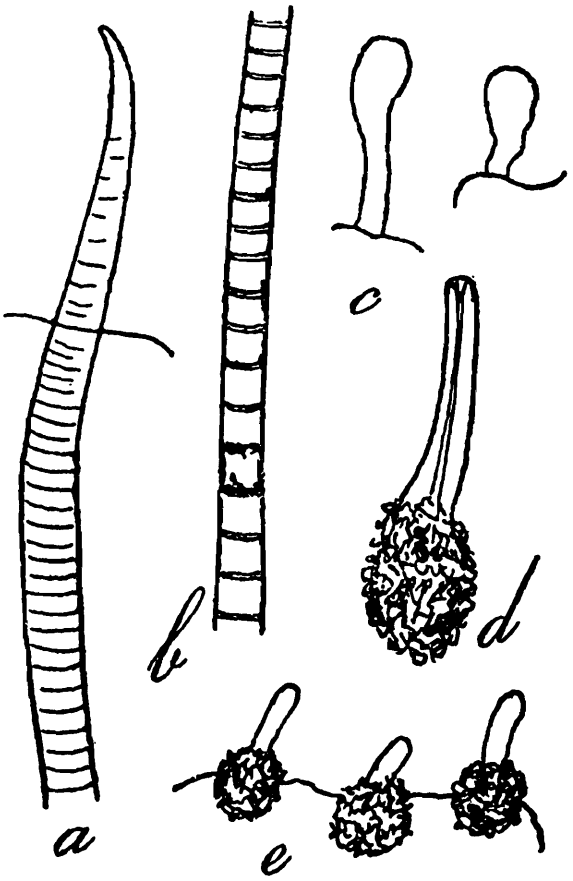

Fig. 182.—***Stylarioides bifidus*** **Fauvel: *a*, ventral hook ×65; *b*, part of a dorsal seta ×150; *c*, naked papillae ×65; *d*, large ooze-coated papilla ×65; *e*, smaller coated papillae ×65.**

some still exist with the ventral hooks which appear farther back and are only well marked in the posterior region. They are yellow, sigmoid, ringed, with a blunt tip and are about 5—6 in each ventral ramus.

Length: 70—80 mm. by 4.5—5 mm.

Colour: in spirit, greyish-white, with small, sparse, orange-coloured tubercles.

Occurrence: Travancore Coast; Arabian Sea, 300—555 fms.

Genus BRADA Stimpson.

Skin papillae. The setae of the anterior segments do not form a marked cephalic cage. Two stout palps. Cirriform branchiae in two clusters, retractile into the mouth. Dorsal ringed capillary setae; stouter simple ventral bristles. One pair of nephridial papillae protruding on one of the anterior segments.

Key to the species of Brada.

1. Body long and slender. Skin papillae small and not sand-retaining ..	*talehsapensis* Fauvel, p. 351.
Body shorter. Large skin papillae retaining sand grains	*mammillata* Grube, p, 352.

339. Brada talehsapensis Fauvel. (Fig. 183, *a—d*).

Brada talehsapensis, Fauvel, 1932, p. 164, fig. 32, pl. VII, fig. 17.

Body long, cylindrical, nearly of the same breadth throughout, abruptly truncated at both ends, with a small rounded knob in front. About 45—60 segments. Few

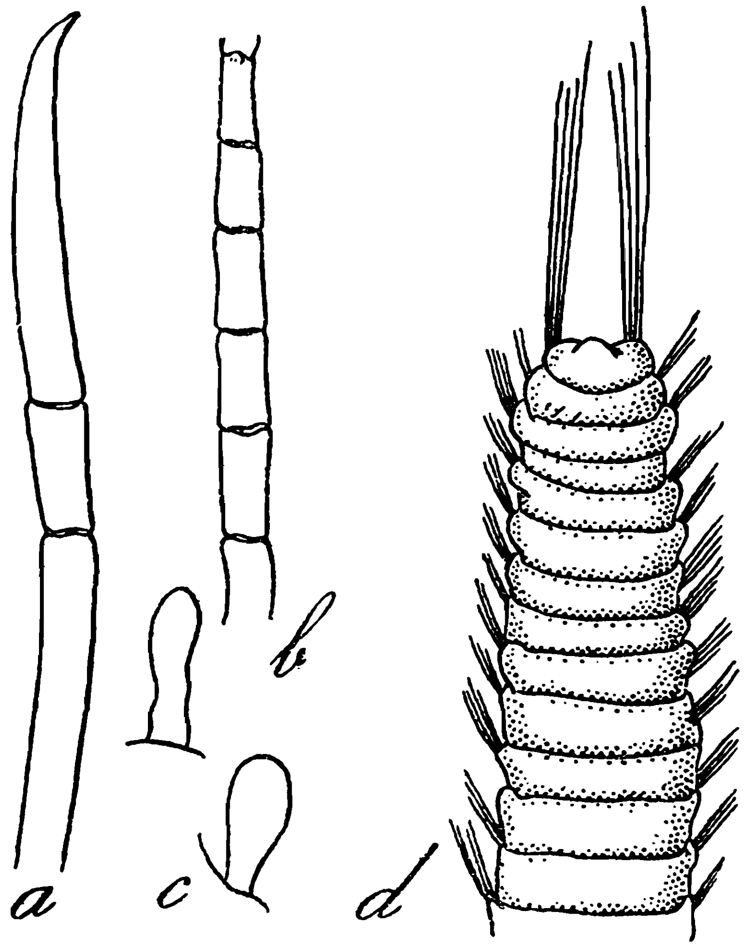

Fig. 183.—*Brada talehsapensis* Fauvel: *a*, ventral hook ×150; *b*, part of a dorsal seta ×150; *c*, papillae ×150; *d*, anterior end, dorsal view, ×12.

small skin-papillae, cylindrical, enlarged at the tip. On the ventral side of the 5th setigerous segment one pair of small, short, rounded nephridial papillae. Bristles of the first setigerous segment directed forwards, but few, slender, articulate, not iridescent. From the 2nd setigerous segment backwards, dorsal bristles shorter, bent, ringed, about 4—6 in each ramus. Ventral rami close to the dorsal ones. Ventral setae, 5—6 yellow curved hooks, with a slightly bent, smooth, translucent tip.

Length: about 27—38 mm. by 2 mm.

Colour: in spirit, greyish-white, with a coating of fine rusty, reddish ooze.

Occurrence: Talèh-Sap, Gulf of Siam.

340. **Brada mammillata** Grube.

Brada mammillata, Grube, 1877, p. 541: McIntosh, 1885, p. 370, pl. XLIII, fig. II, pl. XXIIIA, fig. 7—8: Ehlers, 1897, p. 109: Fauvel, 1932, p. 185.

Body gradually and faintly tapering backwards. Dorsal skin-papillae large, rounded, disposed in rows far apart, sand-retaining. Ventral papillae very small. On the ventral side of the 5th setigerous segment a pair of small conical nephridial papillae. Bristles of the first setigerous segment slender and directed forwards; they do not form a cephalic cage and are not iridescent. On the succeeding segments dorsal setae shorter. Ventral curved hooks from the 2nd setigerous segment, inserted on a round lobe encircled with long cylindrical papillae. Two short, stout, frilled palps. Gills numerous, slender, borne on two semi-circular pads.

Length: 40—50 mm. by 5 mm.

Occurrence: Arabian Sea, 555 fms.

Distribution: Patagonia; Kerguelen Island; Arabian Sea.

Remarks: *Brada villosa* (Rathke), a species smaller but very like *Br. mammillata*, has been reported from the Arabian Coasts (Fig. 184, *e—l*)

Genus DIPLOCIRRUS Haase.

Body elongated or club-shaped, covered with sand-retaining papillae. Two palps. *Branchiae of two kinds* (1) filiform, (2) enlarged. Setae of the first setigerous segments longer than the others, directed forwards and forming a cephalic cage. Dorsal and ventral setae capillary, ringed.

341. Diplocirrus glaucus (Malmgren) (Fig. 184, *a–d*)

Diplocirrus glaucus, Haase, 1914, p. 195, fig. 3–5: Fauvel, 1927a, p. 120, fig. 43, *a–d*; 1932, p. 186.

Trophonia glauca, Malmgren, 1867, p. 192, pl. XIV, fig. 78.

Body swollen anteriorly, moniliform posteriorly. Skin-papillae small, elongated, sparsely disposed. Buccal siphon long, protrusible, with four broad flat branchiae inserted on the anterior border and four slender cirriform branchiae. Four eyes. Two long flattened palps. Setae of the 1st setigerous segment few, very slender,

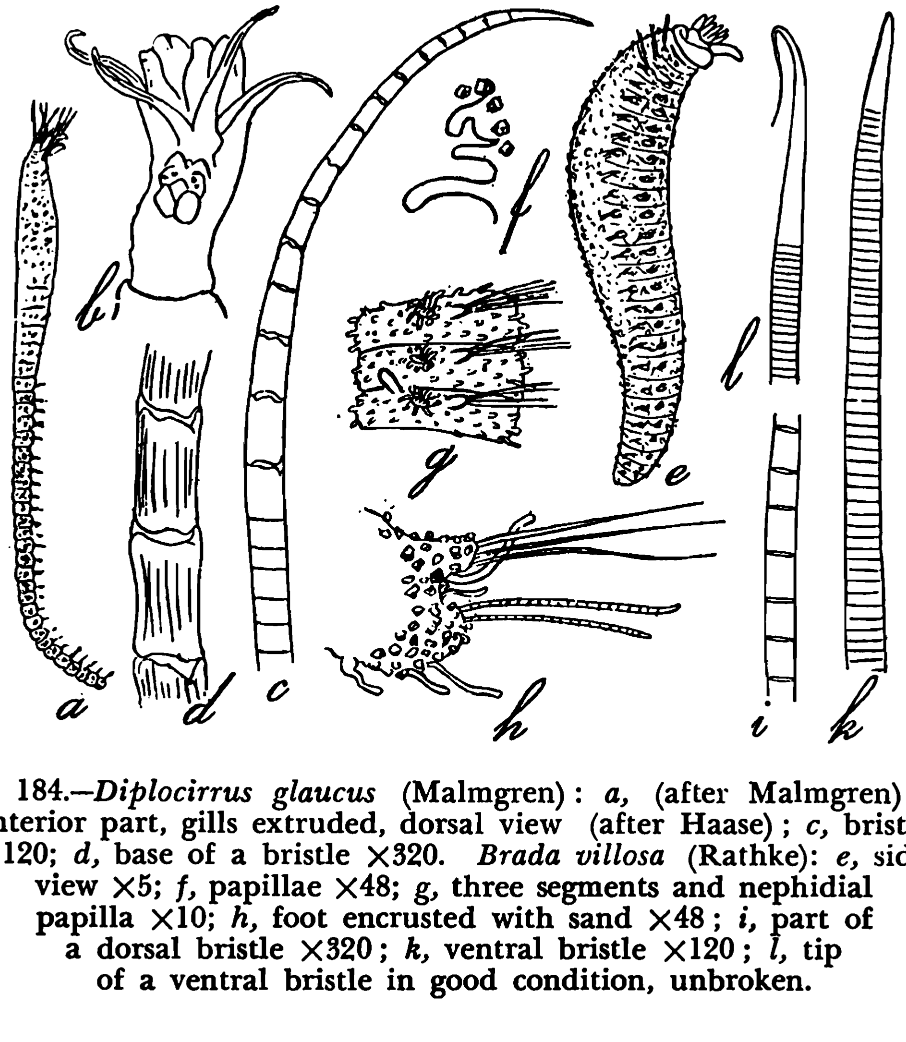

Fig. 184.—*Diplocirrus glaucus* (Malmgren): *a*, (after Malmgren); *b*, anterior part, gills extruded, dorsal view (after Haase); *c*, bristle ×120; *d*, base of a bristle ×320. *Brada villosa* (Rathke): *e*, side view ×5; *f*, papillae ×48; *g*, three segments and nephidial papilla ×10; *h*, foot encrusted with sand ×48; *i*, part of a dorsal bristle ×320; *k*, ventral bristle ×120; *l*, tip of a ventral bristle in good condition, unbroken.

pointing forwards. On the 2nd setigerous segment they are shorter and decrease rapidly on the following ones, the rami of which are well apart. Ventral setae shorter than the dorsal, more curved, with longer articles. *There are no hooks.*

Length: 20–25 mm. by 2 mm.

Occurrence: Mergui, 5 fms.

Distribution: Mergui Archipelago; North Atlantic Ocean.

Remarks: Though the retracted branchiae could not be observed in the Mergui specimen, it may, somewhat doubtfully, be attributed to *Diplocirrus glaucus* by the appearance of the setae.

Incertae sedis

342. **Ilyphagus hirsutus** Monro.

Ilyphagus hirsutus, Monro, 1937, p. 304, fig. 22.

The description of this " sac-like creature, shaped like an *Echiurus*, with a dense uniform, fur-like covering of long cirriform papillae " is really too scanty to fix its place. By its setae, it appears to belong to the Chloraemidae. One might wonder whether it be not a bad specimen of *Buskiella abyssorum* McIntosh ?

Length: 39 mm. by 14 mm.

Occurrence: Arabian Sea, 3385 m.

Family SCALIBREGMIDAE Malmgren.

Body club-shaped, or short fusiform. Prostomium small, bilobed, or with frontal peaks. Sometimes eyes in clusters. Two nuchal grooves. Peristomium achaetous. Proboscis soft, unarmed. Skin generally tessellated or corrugated. Segments subdivided into annuli. Dorsal and ventral rami each bearing setae of two kinds, viz. simple capillary setae and furcate setae, sometimes also acicular setae. Gills, when present, limited to a few anterior segments.

Key to the genera of SCALIBREGMIDAE.

1.	Acicular setae on the first segments	*Parasclerocheilus* Fauvel, p. 355.
	Acicular setae absent ..	*Scalibregma* Rathke, p. 354.

Genus SCALIBREGMA Rathke.

Body arenicoliform. Prostomium T-shaped, with two elongated frontal peaks. Gills present on the anterior segments. Parapodia prominent, flattened. Dorsal and ventral cirri. Acicular setae absent.

343. Scalibregma inflatum Rathke. (Fig. 185, *a–f*)

Scalibregma inflatum, Ashworth, 1901, p. 237, pls. XII–XV: Fauvel, 1927a, p. 123, fig. 44, *a–f;* 1932, p. 186: Moore, 1923, p. 217.

Four pairs of gills on the setigerous segments 2–5. Four anal cirri. Finger-shaped dorsal and ventral cirri

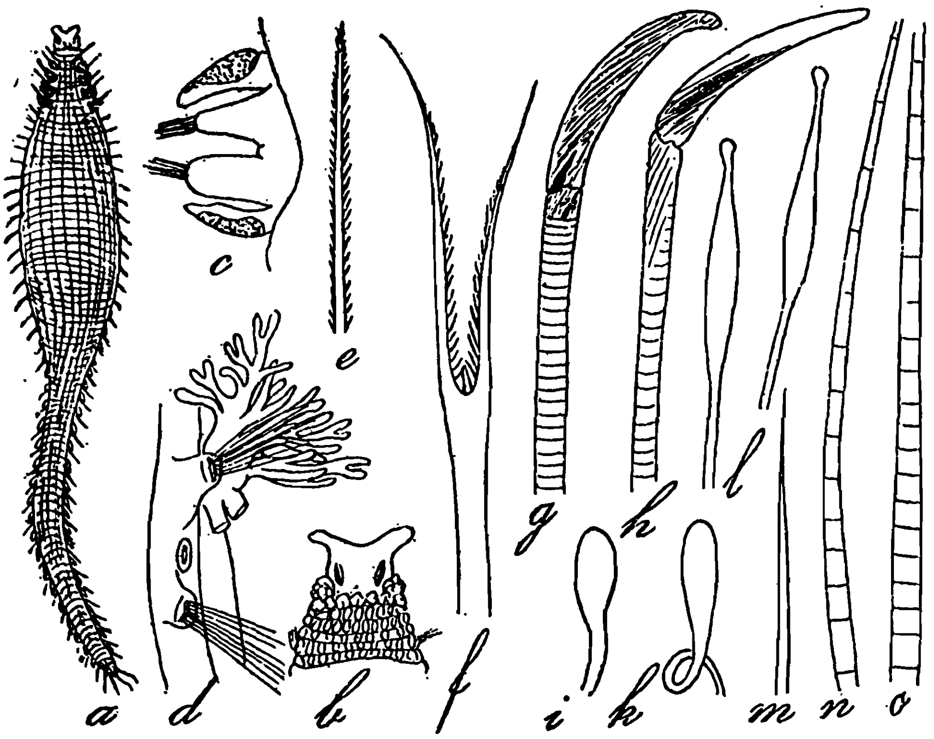

Fig. 185.—*Scalibregma inflatum* Rathke: *a*, dorsal view ×5; *b*, head; *c*, 35th foot ×12; *d*, first branchiferous foot ×10; *e*, capillary bristle ×480; *f*, forked seta ×480. *Flabelligera diplochaitos* (Otto): *g-h*, compound bristles ×120; *i*, *k*, club-shaped papillae ×120; *l*, elongate papillae ×120; *m*, ventral bristle ×120; *n*, *o*, tip and base of a dorsal annulate bristle ×120.

from the 16th–18th segments backwards. Lateral ciliate organ between the rami. Acicular setae absent.

Length: 10–60 mm. by 2–10 mm.

Colour: in life vermilion-red, spotted with yellow.

Occurrence: Gulf of Oman; 609 fms.

Genus PARASCLEROCHEILUS Fauvel.

Body fusiform, elongated. Prostomium T-shaped, with two long frontal peaks and eye-spots. Nuchal organs protractile. Peristomium achaetous. Proboscis unarmed. Anterior segments divided into superficial rings. A few anterior segments bearing branchiae. Dorsal and ventral rami reduced to stout rounded processes. Dorsal cirri absent *A cirrus-like process above the ventral ramus* in

the posterior region. Lateral organs. Acicular setae in the dorsal ramus of the first setigerous segments. Forked setae in the following segments. Anal cirri finger-like.

344. **Parasclerocheilus branchiatus** Fauvel. (Fig. 186, *a—k*).

Parasclerocheilus branchiatus, Fauvel, 1928, p. 159, fig. 1, *a—k*, 1930a, p. 44, fig. 11; 1932, p. 188.

Body rather long, nearly uniform in breadth, slowly tapering backwards, rectangular in section, with a more or less marked ventral groove. Prostomium globular, with two diverging, thick, tentacle-like processes. Four red pigmented plates, linear, arched, converging (eye-spots).

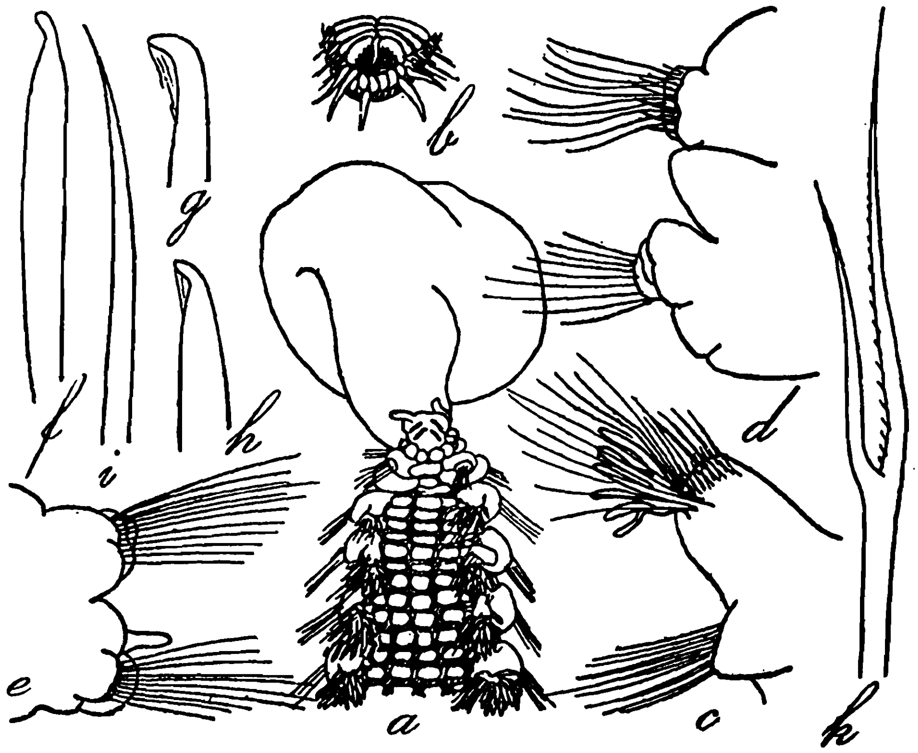

Fig. 186.—*Parasclerocheilus branchiatus* Fauvel: *a,* anterior region, proboscis extruded, dorsal view ×6; *b,* pygidium ×8; *c,* dorsal foot ×24; *d,* 10th foot ×24; *e,* 40th foot ×24; *f,* hook from the 2nd segment ×240; *g,* tip of a lower hook ×320; *h,* tip of an upper hook ×320; *i,* curved seta from the 2nd setigerous segment ×240; *k,* forked seta ×320.

Two protractile cushion-shaped nuchal organs. Peristomium achaetous. Proboscis huge, campanulate. Segments divided into four rings, nearly smooth on the ventral side, rough and corrugated on the dorsal. In the first four setigerous segments, the dorsal ramus carries, in front of a bundle of long capillary setae, large curved acicular setae with a hook at the tip. Of the other dorsal and ventral setae some are capillary, slender and smooth,

while the others are shorter and slightly bent. In the succeeding segments, the dorsal and ventral rami are similar, and in the form of thick rounded processes, without cirri, and each bearing a bundle of capillary setae and shorter, forked, setae with limbs unequal and ciliated on the inner edge. From the 29th setigerous segment to the last one a short slender finger-like process is inserted *above* the ventral ramus. In the last segments this process reaches one-fourth or one-third of the breadth of the body. A lateral organ lies between the two rami. *There are six pairs of branchiae* from the 2nd to the 7th setigerous segment, arborescent, densely ramified as in *Scalibregma*. The first pair, the smallest, has 6—7 filaments, the four last ones are sub-equal and much larger. They are inserted behind the dorsal setae. Pygidium short, with broad terminal vent and 6 anal cirri: I dorsal, I ventral and 2 on each side.

Length: 35 mm. by 3 mm.

Colour: Discoloured in alcohol, with the exception of the reddish-carmine eye-spots.

Occurrence: Mergui Archipelago, Paway Island; Gulf of Mannar, Krusadai Island.

Distribution: India, Gulf of Oman.

Incertae sedis

345. **Oncoscolex microchaetus** Schmarda, 1861, p. 56. Trincomalee.

Family OPHELIIDAE Grube.

Body rather short, dorsum arched, ventral side flat, or with a longitudinal groove. Prostomium conical, destitute of appendages. Cephalic eye-spots hidden under the skin. Often lateral eye-spots on the segments. Segments more or less clearly subdivided into annuli. Proboscis unarmed. Nuchal organs protrusible. Gills cirriform (very rarely branched) or absent. Feet biramous, often reduced to dorsal and ventral bundles of capillary setae. Dorsal cirri absent. Sometimes a few ventral cirri. Lateral sense-organ between the parapodial rami. Pygidium bearing papillae, and often an anal funnel.

Key to the genera of OPHELIIDAE.

1. Lateral gills absent		*Polyophthalmus* Quatrefages, p. 359.
Lateral gills present	..	2

2. Ventral groove absent	*Travisia* Johnston, p. 361.
Ventral groove conspicuous	3
3. Ventral groove limited to the posterior half of the body	*Ophelia* Savigny.
Ventral groove along the whole length of the body	4
4. Lateral eye-spots present	*Armandia* Filippi, p. 358.
Lateral eye-spots absent ..	*Ammotrypane* Rathke, p. 359

Genus ARMANDIA Filippi.

Body elongated, not divided into distinct regions, a deep median and two lateral ventral grooves. Prostomium conical. Eyes on the brain under the skin. Segments divided into annuli. Cirriform gills all along the body from the 2nd setigerous segment. Parapodia with only two bundles of capillary setae. A small ventral cirrus. Anal funnel fringed with papillae, and a median cirrus. Lateral eye-spots on many segments.

Key to the species of Armandia.

1. 29—30 setigerous segments	*lanceolata* Willey, p. 358.
33—37 setigerous segments ..	*leptocirris* Grube, p. 358.

346. Armandia lanceolata Willey.

Armandia lanceolata, Willey, 1905, p. 288, pl. V, fig. 120; Augener, 1914, p. 33; 1926, p. 462: Fauvel, 1930b, p. 547; 1932, p. 189.

29 (occasionally 30) setigerous segments. Gills from the 2nd setigerous segment, absent on the last 3 segments. Generally 11-12 pairs of eye-spots beginning about the 7th setigerous segment. Anal funnel compressed, short, fringed with 12—20 small papillae. A median anal cirrus.

Length: 20—35 mm. by 2—3 mm.

Colour: whitish.

Occurrence: Mergui Archipelago; Ceylon; Pamban.

Distribution: Australia, New Caledonia, Indo-China; India, Persian Gulf.

347. Armandia leptocirris Grube.

Armdndia leptocirris, Willey, 1905, p. 289: Fauvel, 1930a, p. 50; 1932, p. 190.

Ophelina leptocirris, Grube, 1878, p. 194.

33 to 38 setigerous segments. Gills from the 2nd setigerous segment to the last one. 10—12 pairs of lateral eyes from about the 7th setigerous segment. Anal funnel long, compressed, slantingly cleft, fringed with long papillae. A long median anal cirrus.

Length: 15—30 mm.

Colour: Decoloured in spirit.

Occurrence: Andaman Islands; Gulf of Mannar; Krusadai Lagoon, burrowing in sand.

Distribution: New Caledonia, Philippine Islands, Indo-China; Andaman Islands, Gulf of Mannar, Persian Gulf, Red Sea.

Genus AMMOTRYPANE Rathke.

Body vermiform, not divided into distinct regions. A deep ventral groove all along the ventral side and two lateral ridges. Prostomium conical. Cephalic eyes hidden under the skin. *No lateral eyes.* Segments divided into annuli. Cirriform gills from the 2nd setigerous segment nearly to the end. Parapodia with short setigerous lobes and two bundles of simple setae. A small ventral cirrus. Anal funnel with papillae and anal cirrus.

348. Ammotrypane aulogaster Rathke. (Fig. 187, *a—e*)

Ammotrypane aulogaster, Fauvel, 1927a, p. 133, fig. 47, *a—e;* 1932, p. 190: Hoagland, 1920, p. 625.

Prostomium conical, ending in a filiform clavate tip. Gills absent only on the last 3—4 segments. Ventral cirri small, conical. Anal funnel spoon-shaped, with a large ventral opening fringed with small papillae. Two large ventral papillae and a median anal cirrus with a long cirrostyle borne on a cylindrical cirrophore.

Length: about 50 mm. by 3 mm. 60—68 segments.

Colour: pearl-grey. Gills red.

Occurrence: Orissa Coast; Madras, Ennur Backwater; Persian Gulf.

Distribution: Philippine Islands; India, Persian Gulf; Atlantic Ocean, Arctic Seas.

Genus POLYOPHTHALMUS Quatrefages.

A longitudinal ventral groove. Prostomium short. Cephalic and lateral eye-spots. Nuchal organs protrusible. *Gills and ventral cirri absent.* Biramous parapodia with capillary simple setae. Anal funnel fringed with papillae.

349. Polyophthalmus pictus Dujardin. (Fig. 187, *l—o*).

Polyophthalmus pictus, Fauvel, 1927a, p. 137, fig. 48, *l—n;* 1930b, p. 546; 1932, p. 191.
Polyophthalmus ceylonensis, Kukenthal, 1887, p. 371, pl. XXI, figs. 12—13.
Polyophthalmus collaris, Michaelsen, 1892, p. 17, fig. 5.
Polyophthalmus setosus, Michaelsen, 1892, p. 16, fig. 14.
Polyophthalmus australis Grube, Willey, 1905, p. 289.

27—28 setigerous segments. There are no prominent setigerous lobes. Only a single bundle of capillary setae

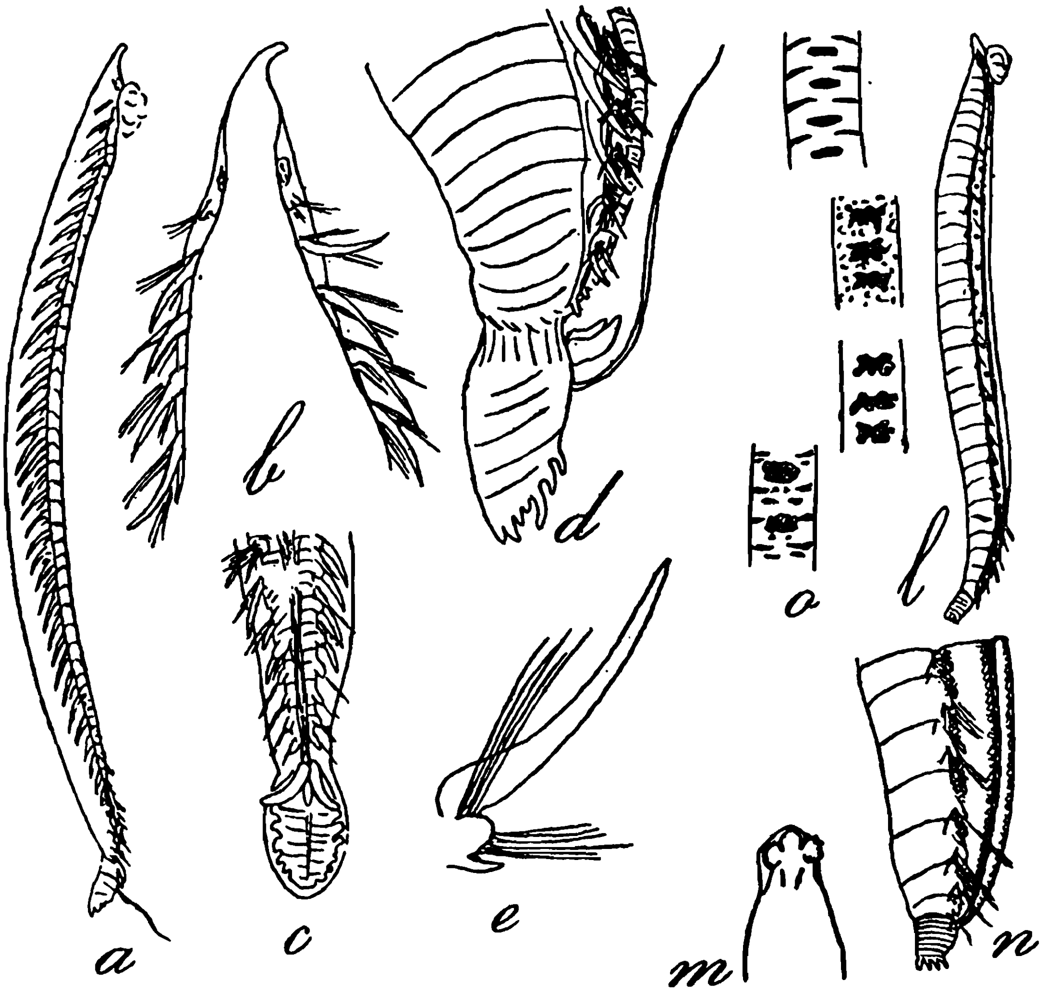

Fig. 187.—*Ammotrypane aulogaster* Rathke: *a,* side view ×2; *b,* anterior part ×8; *c,* anal tube, ventral view, median cirrus lost ×5; *d,* posterior part with anal tube, side view ×6; *e,* foot from mid-body ×8. *Polyophthalmus pictus* (Dujardin): *l,* side view ×5; *m,* head, nuchal organs everted ×10; *n,* posterior part with anal tube ×10; *o,* several kinds of dorsal paterns.

in each foot, except in the last ones. Nephridial pores on segments 8—11.

Length: 10—25 mm. by 1—2 mm.

Colour: extremely variable, brown spots or streaks, more or less conspicuous and arranged in several different dorsal patterns; this has caused it to be described under

many names which are really synonymous. The *P. longisetosus* Michaelsen, found pelagic at Ceylon, is only the epitocous swimming form, with long bristles, which swarms on the surface when mature.

Occurrence: Gulf of Mannar, Ceylon, Pamban, Kilakarai; Maldive Archipelago, Fehendu.

Distribution: Pacific, Indian and Atlantic Oceans, Mediterranean Sea. Cosmopolitan.

Genus TRAVISIA Johnston.

Body divided into two distinct regions, an anterior enlarged and a posterior narrow, square in section. There is no marked ventral groove. Prostomium small, conical. Two nuchal organs. Proboscis unarmed, soft, globular, more or less lobed. Segments divided into annuli. Branchiae from the 2nd setigerous segment, cirriform, or very rarely branched. Dorsal and ventral rami reduced to a bundle of capillary setae. In the posterior region, huge lateral fleshy processes. Ventral cirri absent. A lateral sense organ between the rami. Pygidium, a rounded lobe.

350. Travisia arborifera Fauvel. (Fig. 188, *a–f*)

Travisia arborifera, Fauvel, 1932, p. 191, fig. 33, *a–f*.

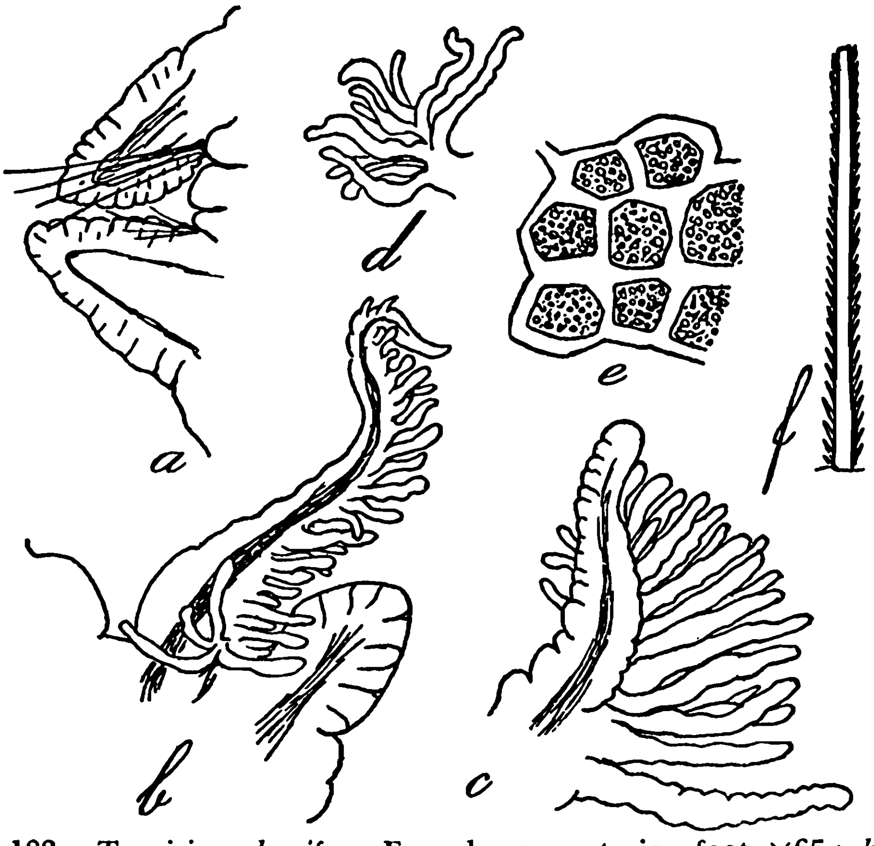

Fig. 188.—*Travisia arborifera* Fauvel: *a*, posterior foot ×65; *b*, posterior gill ×65; *c*, gill from mid-body ×85; *d*, part of a gill ×85; *e*, polygonal glandular areas of the tegument ×75; *f*, part of a seta ×350.

Body short, plump, spindle-shaped. 36 setigerous segments subdivided into annuli. Posterior segments imbricated, square in section. Skin divided into polygonal glandular areas. Prostomium rounded, ending in a small conical tip. Two small nuchal organs. *Gills branched,* beginning on the 2nd setigerous segment and missing only on the last 6—7 segments. Dorsal and ventral rami far apart and each reduced to a bundle of simple, smooth, or very finely barbed capillary setae inserted in a pit. A small triangular fleshy lamella in front of the gills; a similar, slightly larger, lamella in the ventral ramus. In the posterior part of the body these lamellae are larger. A lateral pit-like sense organ between the rami, conspicuous even on the first setigerous segment. Nephridial pores from the 3rd to the 14th setigerous segment. Pygidium ending in a knob with 6—8 short cirri. Vent terminal.

Length: 10—38 mm. by 3—10 mm.

Occurrence: Andaman Sea, 53 fms.: off Puri, Orissa, 4—4½ fms.

Family CAPITELLIDAE Grube.

Body divided into a thorax and an abdomen. Prostomium conical, without appendages. Proboscis unarmed, papillose. Peristomium achaetous. Branchiae simple, compound, or absent altogether. Parapodia biramus. Dorsal and ventral cirri absent. Capillary setae and hooks borne on uncinigerous tori. Lateral sense-organs.

Key to the genera of CAPITELLIDAE.

1. Thorax with only capillary setae	2
Thorax with capillary setae and hooks ..	9
2. Thorax with 13 setigerous segments. Compound retractile abdominal gills	*Dasybranchus* Grube, p. 365.
Thorax with less than 13 setigerous segments ..	3
3. Twelve thoracic setigerous segments	4
Less than twelve thoracic segments ..	5
4. Anal funnel cup-shaped with radiating acicular bristles	*Scyphoproctus* Gravier, p. 372.

A broad, round, anal plate without acicular bristles, two long anal cirri	*Heteromastides* Augener, p. 367.
5. Eleven thoracic setigerous segments ..	6
Less than eleven thoracic segments	8
6. More or less developed gills	7
Abdominal gills and raised uncinigerous tori absent ..	*Capitellethus* Chamberlin, p. 370.
7. Posterior segments strobiliform	*Mastobranchus* Eisig, p. 369.
Posterior segments not strobiliform	*Notomastus* Sars, p. 363.
8. Seven thoracic setigerous segments. A dorsal copulatory organ	*Branchiocapitella* Fauvel, p. 371.
Nine thoracic setigerous segments. Posterior segments with stout dorsal spines	*Pulliella* Fauvel, p. 374.
9. First 6 setigerous segments with capillary setae; the next 5 with long hooks ..	*Barantolla* Southern, p. 370.
First 5 setigerous segments with capillary setae; the next 6 with long hooks. Gills	*Heteromastus* Eisig, p. 366.
First 4 setigerous segments with capillary setae; the next 7 with hooks ..	*Paraheteromastus* Monro, p. 368.

Genus NOTOMASTUS Sars.

Thorax of eleven setigerous segments, with only dorsal and ventral capillary setae. Abdomen with hooded hooks borne on raised tori. Gills reduced to short processes of the parapodial ridge, or, sometimes, compound. Thorax tessellated.

Key to the species of Notomastus.

1. Parapodial gills on both rami, the dorsal ones small, globular, on the lower edge of the dorsal ridge	*latericeus*, Sars, p. 364.
Dorsal gills compound	*giganteus* Moore, p. 365.

351. **Notomastus latericeus** Sars. (Fig. 189, *a—h*).

Notomastus latericeus, Fauvel, 1927a, p. 143, fig. 49, *a—h;* 1932, p. 194: Ehlers, 1897, 117.

(?) *Notomastus zeylanicus*, Willey, 1905, p. 287, pl. V, figs. 118—119.

Thorax tessellated, segments bi-annular. Peristomium bi-annular, achaetous. First dorsal tori close to each other, coalescent; farther back they are well apart. Gills rudimentary and are represented by lateral processes of the

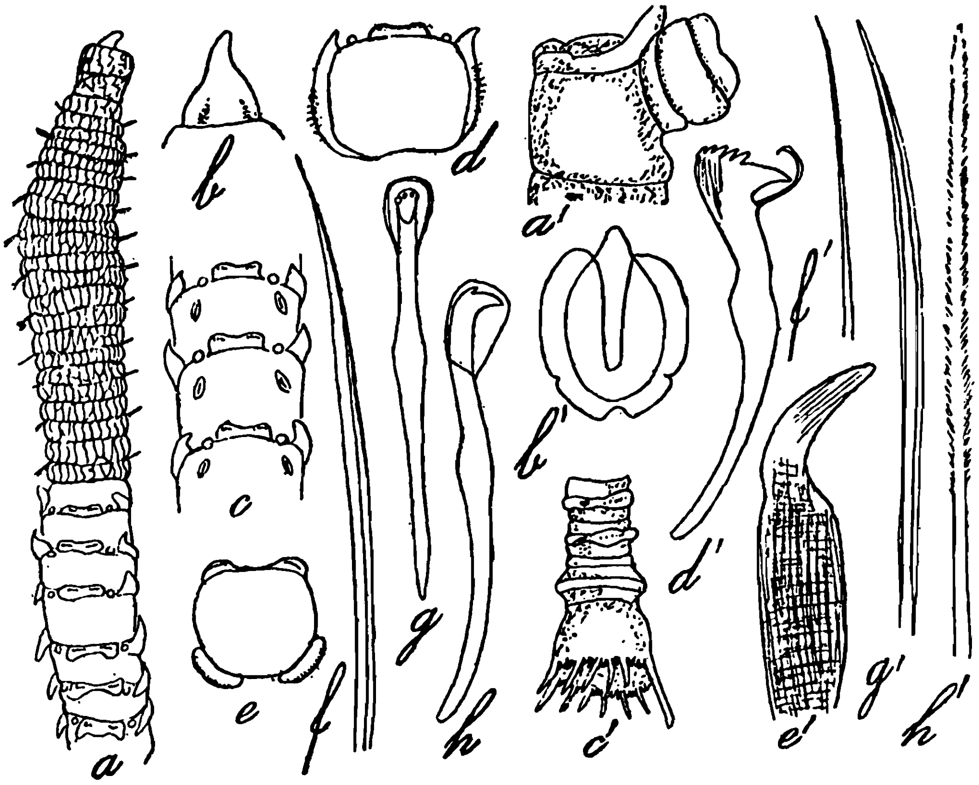

Fig. 189.—*Notomastus latericeus* Sars: *a*, anterior part ×3; *b*, prostomium; *c*, anterior abdominal segment, with a pair of large genital pores behind the dorsal tori; *d*, section of the anterior part of the abdominal region; *e*, section of the posterior region; *f*, capillary bristle ×120; *g*, *h*, hooks, dorsal and side view, ×360. *Clymene santanderensis* Rioja: *a'*, head, side view ×3; *b'*, head from above ×3; *c'*, anal funnel ×5; *d'*, ventral hook ×120; *e'*, acicular hook from the first setigerous segment ×96; *f'*, capillary bristle ×96; *g'*, winged bristle ×96; *h'*, pinnate bristle (after Rioja).

dorsal ridges and of the upper end of the ventral tori. Genital pores from the 2nd abdominal segment. Very brittle in the posterior part.

Length: 150—300 mm. by 3—5 mm.

Colour: in life, bright red anteriorly.

Occurrence: Andaman Islands; Bay of Bengal; Ceylon; Gulf of Oman.

Distribution: Magellan, Chile; Bay of Bengal, Gulf of Oman; Atlantic Ocean; Mediterranean Sea, Falkland Islands.

352. **Notomastus giganteus** Moore.

Notomastus giganteus, Moore, 1906, p. 227, pl. XI, figs. 24—25: Fauvel, 1932, p. 194.
Dasybranchus giganteus, Moore, 1909, p. 279, pl. IX, fig. 57.

Body of large size. Prostomium rounded, with a small conical tip. Without eyes. Thoracic segments bi-annulate and partly tessellated. Eleven segments with capillary dorsal and ventral setae. First abdominal dorsal tori very small, connected across the dorsum by a low transverse fold: posteriorly they become obsolete. First abdominal ventral tori ending in a sharp upper process which decreases in size farther back. Gills retractile and usually obscured anteriorly; on the middle and abdominal segments they become conspicuous bushy tufts, composed of numerous (about 20—30) filaments arising from the posterior end of the dorsal tori, or posteriorly, when the tori become obsolete, replacing them. A pair of large genital pores on the first 9 abdominal segments.

Length: 140 mm. and more, by 7 mm.

Occurrence: Off Puri, Orissa, 4—4½ fms.; N. E. of Ceylon, 200—350 fms.

Distribution: North Pacific Ocean, Gulf of Georgia, San Diego, California; India, Ceylon.

Genus DASYBRANCHUS Grube.

Thorax with thirteen setigerous segments bearing only capillary setae. Abdomen with only hooks inserted on dorsal and ventral tori. *Retractile gills* inserted at the upper end of the abdominal tori.

353. **Dasybranchus caducus** Grube. (Fig. 190, *a—h*)

Dasybranchus caducus, Eisig, 1887, p. 823, pl. XVII—XXIII: Fauvel, 1927a, p. 148, fig. *a—h*: Monro, 1937, p. 305.
Dasybranchus cirratus, Grube, 1867, p. 28, pl. III, fig. 4.

Prostomium small, conical. Peristomium long, achaetous. Compound gills, with numerous simple filaments, from about the 20th abdominal segment. Body tough. Genital pores from the last thoracic segment.

Length: 250—300 mm. by 10—15 mm.

Colour: in life thorax blood red, abdomen yellowish. Gills red.

Occurrence: Burma, off Akyab; Andaman Islands; Gulf of Mannar; Maldive Archipelago.

Distribution: Pacific, Indian and Atlantic Oceans.

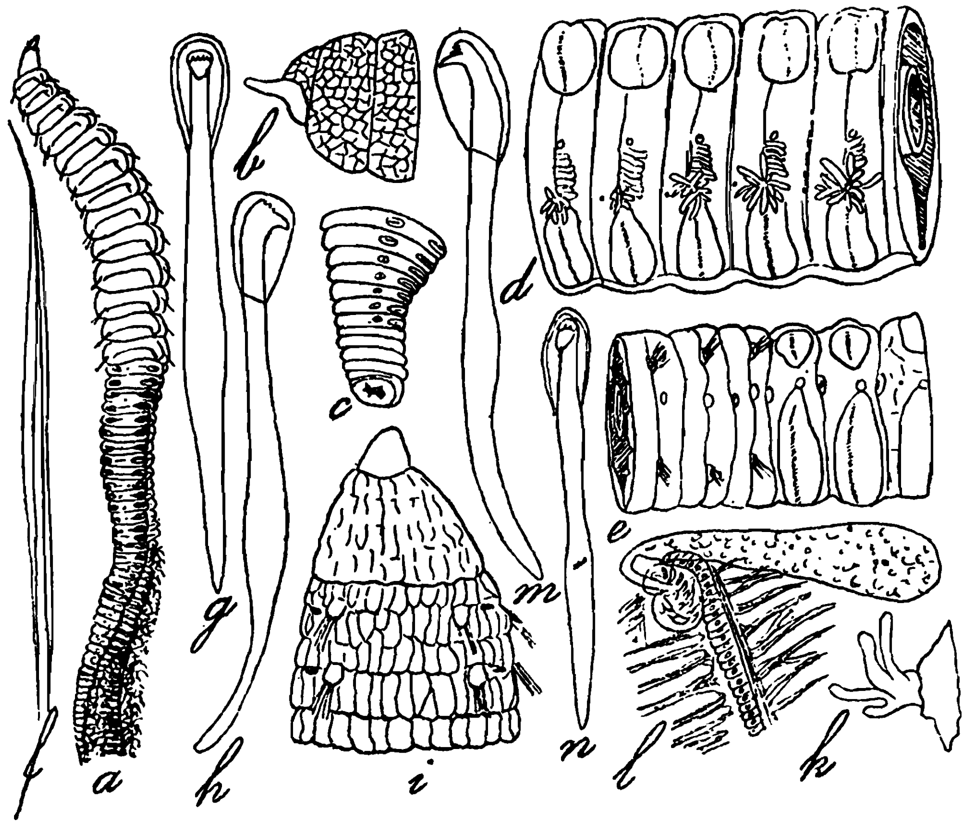

Fig. 190.—*Dasybranchus caducus* Grube: *a*, anterior part, natural size: *b*, postomium, side view; *c*, posterior end; *d*, segments of the middle region of the abdomen, from above downwards, dorsal tori, lateral knobbed-organ, branchial vesicles, compound gills, ventral tori; nephridiopores between the gills; *e*, last thoracic segments and first abdominal ones, side view; *f*, thoracic bristle; *g*, *h*, hooks, front and side view. *D. gajolae Eisig*: *i*, prostomium; *k*, compound gill; *l*, parapodial gland; *m*, *n*, hooks (after Eisig).

Genus HETEROMASTUS Eisig.

Thorax with eleven setigerous segments, the first five with only capillary setae, the next six with long stalked hooks. Abdomen with only shorter hooks inserted on tori. Posterior segments campanulate, or strobiliform. The parapodial gills are but an extension of the ventral tori. A median anal cirrus.

354. **Heteromastus similis** Southern. (Fig. 191, *a–d*)

Heteromastus similis, Southern, 1921, p. 640, pl. XXIX, fig. 3: Fauvel, 1930a, p. 46; 1932, p. 195.

Heteromastus sp., Gravely, 1927, p. 26.

Prostomium conical, pear-shaped. Peristomium long, achaetous. Body long, slender, swollen at the anterior end, tapering gradually to the tail. The first abdominal segments are not conspicuously elongated. Lateral lobes absent in the posterior moniliform segments.

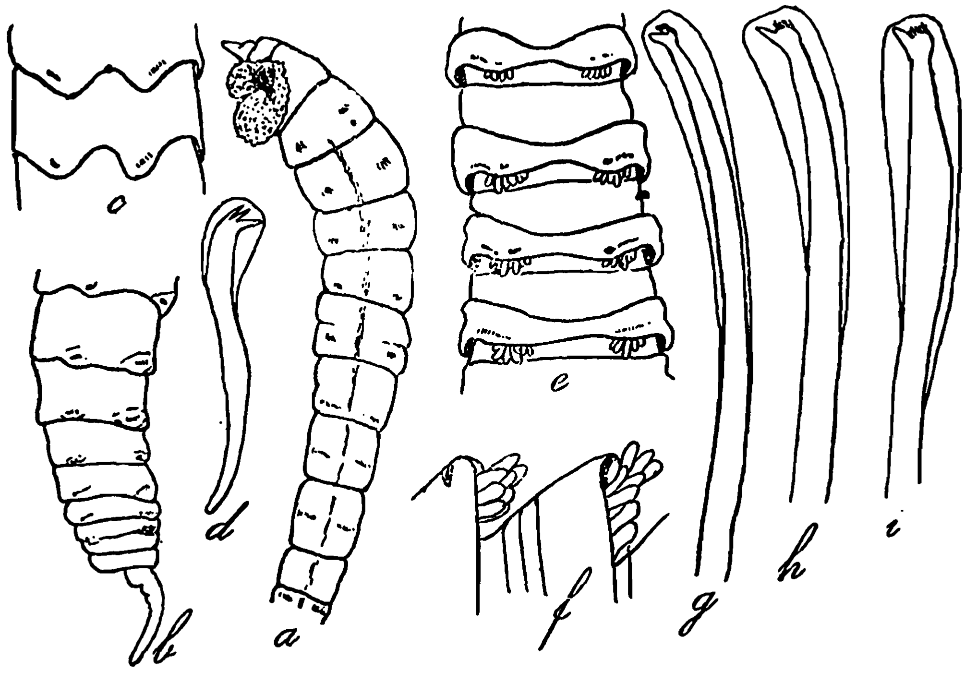

Fig. 191.—*Heteromastus similis* Southern: *a*, anterior end, side view ×12; *b*, posterior end, side view ×36; *c*, 180th segment, dorsal view ×36; *d*, ventral hook from the 86th segment ×420. *Barantolla sculpta* Southern: *e*, dorsal view of segments 115-118×25; *f*, lateral view of gills and dorsal lobes in the posterior segments ×636; g, tip of a dorsal hook from the 7th foot ×553. *Mastobranchus indicus* Southern. *h*, tip of a long hook from the ventral division of the 11th foot ×713; *i*, tip of the dorsal hook from the 14th foot ×713 (after Southern).

Length: 215 mm. and more by 1.5—1.8 mm.

Remark: Hardly distinct from, and, probably synonymous with, *H. filiformis* Claparède.

Occurrence: Taléh-Sap, Gulf of Siam; Chilka Lake; Vizagapatam; Kutikal, Gulf of Mannar.

Genus HETEROMASTIDES Augener.

Thorax with 12—13 setigerous segments with capillary setae on both rami: abdomen with hooks. There are no gills. An anal plate with two cirri.

355. Heteromastides bifidus Augener. (Fig. 192, *a–b*)

Heteromastides bifidus, Augener, 1914, p. 64, fig. 8, pl. I, fig. 11: Fauvel, 1930a, p. 47, fig. 12.

Prostomium bluntly finger-shaped. Two lateral clusters of small eye-spots. Abdominal segments more or less moniliform. The 4–5 penultimate segments are provided with a small triangular process pointing backwards, the

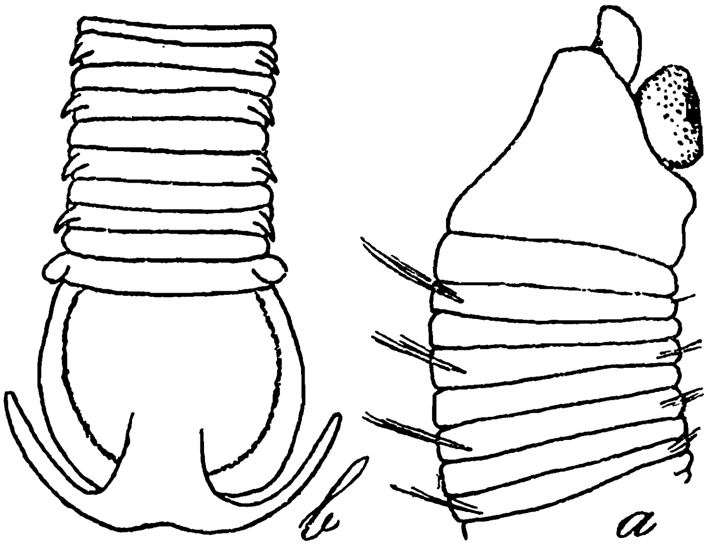

Fig. 192.—*Heteromastus bifidus* Augener: *a*, anterior region, side view ×40; *b*, posterior region and pygidium ×40.

last carries, on each side, a small globular swelling. A broad, round, anal plate, slightly slanting, bearing two long finger-shaped diverging cirri.

Length: 10 mm. by 0.8 mm.: upwards of 70 segments.

Occurrence: Gulf of Mannar, Krusadai Island.

Distribution: Australia; India.

Genus PARAHETEROMASTUS Monro.

" Thoracic region of twelve segments of which eleven are setigerous. Of these eleven, the first four carry bordered capillary bristles only, and the remaining seven only hooks with narrow stems and long guards. The abdomen carries only hooks, different from those of the thorax. There is no tessellation of the thorax. In the abdominal region, there is little development of the parapodial tori and *no branchiae are present*. The pygidium has a single rather short cirrus." (Monro)

356. Paraheteromastus tenuis Monro. (Fig. 194, *c—f*).

Paraheteromastus tenuis, Monro, 1937, p. 536, fig. 2b.

The body swells out in the anterior thoracic region. Division between thorax and abdomen not conspicuous. Prostomium short, conical, without eyes. The first 4 setigerous segments carry only short, widely bordered capillary bristles. The remaining 7 thoracic segments carry only rather large hooks with narrow stems and long guards. The abdominal hooks are smaller than the thoracic and have a subterminal enlargement and shorter and more rounded guards.

The body in the long abdominal region is externally almost as featureless and homogeneous as that of an Oligochaete. The parapodial ridges are very little developed. In the hindmost part they are represented by a slight swelling of the segments in the dorso-lateral and ventro-lateral regions. There are no branchiae and the hinder abdominal segments are not campanulate. A short pygidial cirrus.

Length: 50 mm. by 0.5 mm. 140 segments.

Colourless, in spirit.

Occurrence: Maungmagan, Burma.

Genus MASTOBRANCHUS Eisig.

Thorax of eleven setigerous segments *with only dorsal and ventral capillary setae.* Abdomen with capillary setae and hooks on the dorsal ramus and hooks only on the ventral ramus. Thoracic feet claviform. Anterior abdominal segments long, cylindrical, *the posterior ones strobiliform or campanulate.* Parapodial gills simple, next compound and retractile.

357. Mastobranchus indicus Southern. (Fig. 191, *h, i*)

Mastobranchus indicus, Southern, 1921, p. 645, pl. XXX, fig. 25.

Prostomium small, rounded. No eyes. Skin of the anterior region tessellated. Lateral organs not very distinct. 4 pairs of genital pores behind the segments 8—11. Tori in segments 2—4 very short, longer on the subsequent segments. The right ventral bundles of the 11th foot contain two very elongate hooks. The dorsal bundles on 13th and 14th segments contain only capillary setae, the ventral bundles only hooks, that are much larger and shorter than those of the right 11th foot. In the dorsal bundle of the 15th segment there are only hooks.

Length: 46 mm. by 3 mm. Only an imperfect specimen with 90 segments. Gills and posterior part unknown.

Occurrence: Barantolla, near Calcutta; from brackish pools, salt lakes.

Genus BARANTOLLA Southern.

"Capitellidae having 12 thoracic segments, of which the first is achaetous. Segments 2—7 have only capillary setae, segments 8—12 only elongate crochets. The abdominal segments have short crochets only. The anterior thoracic segments have reticulate markings on the skin, and the sculpture of the thoracic segments is rather elaborate. Branchiae in the form of short finger-shaped lobes behind the dorsal setae of the middle and posterior segments. These segments are provided each with a membranous collar, produced into four shallow parapodial lobes." (Southern)

358. **Barantolla sculpta** Southern. (Fig. 191, *e*—*g*)

Barantolla sculpta, Southern, 1921, p. 643, pl. XIX, fig. 24: Fauvel, 1932, p. 196.

Body widest near 4th—5th segment, very gradually tapering backwards. Prostomium two-ridged, without eyes. Proboscis covered with minute papillae. First four segments tessellated. Capillary setae with narrow wings. In segments 8—12 only long hooks resembling those of *Heteromastus*, ending in a strong tooth with 5—6 slender spines on the crest and a long hood. Abdominal crochets much smaller. Gills begin about 55th—60th—70th segments; they lie under the dorsal parapodial lobes, each consisting of 3—4 short rounded lobes hidden by the parapodial lobes: the larger possess up to 9—11 finger-shaped lobes. A median anal cirrus.

Length: 55—60 mm. by 2—3 mm. Segments numerous.

Occurrence: Taléh-Sap; Gulf of Siam; Barantolla, near Calcutta.

Genus CAPITELLETHUS Chamberlin.

Capitellides Ehlers, *non* Mesnil.

Thorax exclusively with capillary setae, abdomen with crochets exclusively. Branchiae none. Eleven setigerous thoracic segments; no other macroscopic distinction between thorax and abdomen.

359. **Capitellethus dispar** (Ehlers)

Capitellethus dispar, Chamberlin, 1919, p. 466: Fauvel, 1930b, p. 548; 1932, p. 197.

Capitellides dispar, Ehlers, 1907, p. 24, fig. 15.

Notomastus zeylanicus, Augener, 1926a, p. 172; 1927a, p. 218 (*non* Willey?).

The characters of the one species are those of the genus. The body slender, filiform, without any apparent difference between the thorax and the abdomen, is very like that of an Oligochaete.

Length: 15 mm. by 0.8 mm.

Occurrence: Vizagapatam.

Remarks: Augener identifies this species with *Notomastus zeylanicus* Willey (1905), but I very much doubt their synonymy.

Genus BRANCHIOCAPITELLA Fauvel.

Thorax with seven setigerous segments, bearing dorsal and ventral capillary setae. On the 8th and 9th segments ventral hooks and a dorsal copulatory organ with modified large spines. In the abdomen dorsal and ventral hooks and *dorsal cirriform gills.*

360. **Branchiocapitella singularis** Fauvel. (Fig. 193, *a*—*f*).

Branchiocapitella singularis, Fauvel, 1932, p. 197, pl. VII, figs. 9—14.

Body slender, filiform, slightly enlarged in the thorax; about 200 segments or more. Skin faintly tessellated in the anterior segments. Prostomium blunt conical, without eyes. Peristomium achaetous, short ventrally and overhanging the prostomium on the dorsal side where it is twice as long. The first 8—9 segments biannulate, larger and more swollen than those following. Maximum breadth about the 6th segment. The first 7 setigerous segments bearing each two dorsal and two ventral bundles of capillary setae. On the 8th and 9th segments ventral hooded hooks and a dorsal copulatory apparatus armed with 8 large, bent, acicular spines (two in each ramus) converging towards the boundary of the two segments between which opens the male genital pore. In each dorsal ramus there are two bristles, a long one and a shorter supplementary seta. An ovate gland lies between the posterior bristles. From the 10th setigerous segment

backwards dorsal and ventral hooded hooks. In the abdominal region the body is semi-circular in section. Dorsal and ventral uncinigerous tori are short, little raised, transverse pads. About the 80th setigerous segment

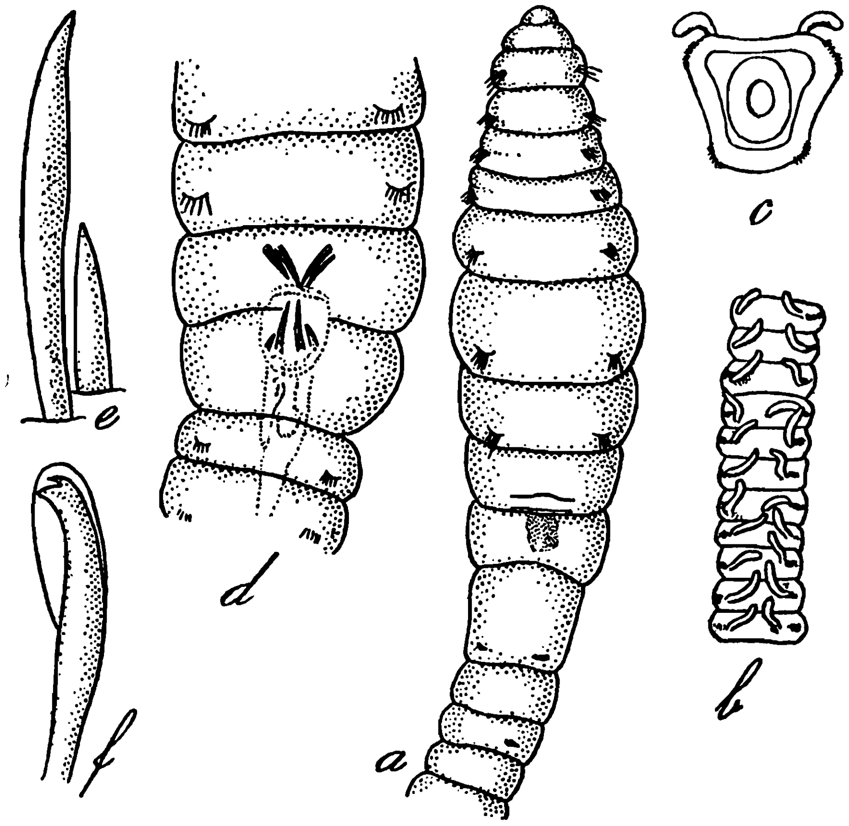

Fig. 193.—*Branchiocapitella singularis* Fauvel: *a,* anterior end, dorsal view ×8; *b,* posterior region, dorsal view ×8; *c,* cross section of abdomen ×10; *d,* segments 6 to 11 and dorsal capulatory organ ×25; *e,* right posterior pair of copulatory spines ×147; *f,* abdominal hook ×630 (from Fauvel 1932).

the gills make their appearance; they are small, finger-shaped, with one or two filaments inserted on the inner end of the dorsal tori. Pygidium a short faintly bilobed knob.

Length: up to 95 mm. by 1 mm.

Decoloured, in spirit.

Occurrence: Barantolla or Vizagapatam.

Genus SCYPHOPROCTUS Gravier.

Thorax of 14 segments, of which 12 carry only capillary setae. Abdomen with only hooded hooks. *No gills. An anal cup-shaped funnel with radiating acicular bristles.* Two long anal cirri.

361. Scyphoproctus djiboutiensis Gravier. (Fig. 194, *a, b*).

Scyphoproctus djiboutiensis, Gravier, 1906, p. 181, pl. III, figs. 200–204: Fauvel, 1930a, p. 48.

Prostomium short, conical, eyeless. The first two segments achaetous. Capillary setae long and slender. Dorsal and ventral abdominal tori without processes. The

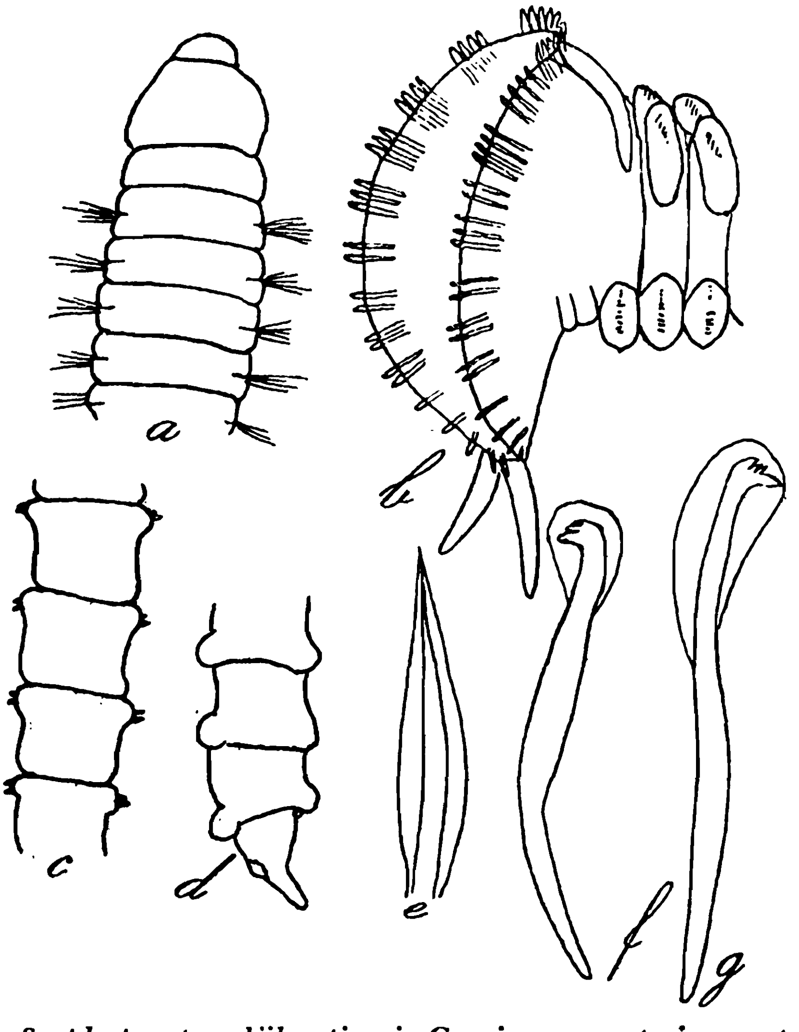

Fig. 194.—*Scyphoproctus djiboutiensis* Gravier: *a*, anterior part, dorsal view; *b*, anal funnel, side view (after Gravier). *Paraheteromastus tenuis* Monro: *c*, segments from mid-abdominal region; *d*, terminal segments, side view; *e*, anterior thoracic bristle; *f*, abdominal hook; *g*, thoracic hook (after Monro).

anal funnel is a cup-like plate, the walls of which are stiffened with bundles of acicular setae. It is provided with two long finger-shaped cirri.

Length: 25 mm. by 0.6 mm.

Colour: yellowish-brown.

Occurrence: Gulf of Mannar, Krusadai Island.

Distribution: India, Red Sea.

Genus PULLIELLA Fauvel.

Body divided into three distinct regions: (1) thoracic, the 9 segments of which bear only capillary setae in both rami; (2) abdominal, with hooks in both rami and dorsal tori well apart; (3) posterior *with dorsal acicular setae and ventral hooks.* The last segments are partly fused together. Pygidium with two stout, conical, ventral cirri. Branchiae absent.

362. Pulliella armata Fauvel. (Fig. 195, *a–h*).

Pulliella armata, Fauvel, 1930a, p. 48, fig. 13; 1930b, p. 549; 1935, p. 342.

Body swollen at both ends. Three regions clearly distinct. Prostomium blunt, two eyes. Peristomium achaetous, biannulate. The nine following segments are short, close together, biannulate, smooth, without any

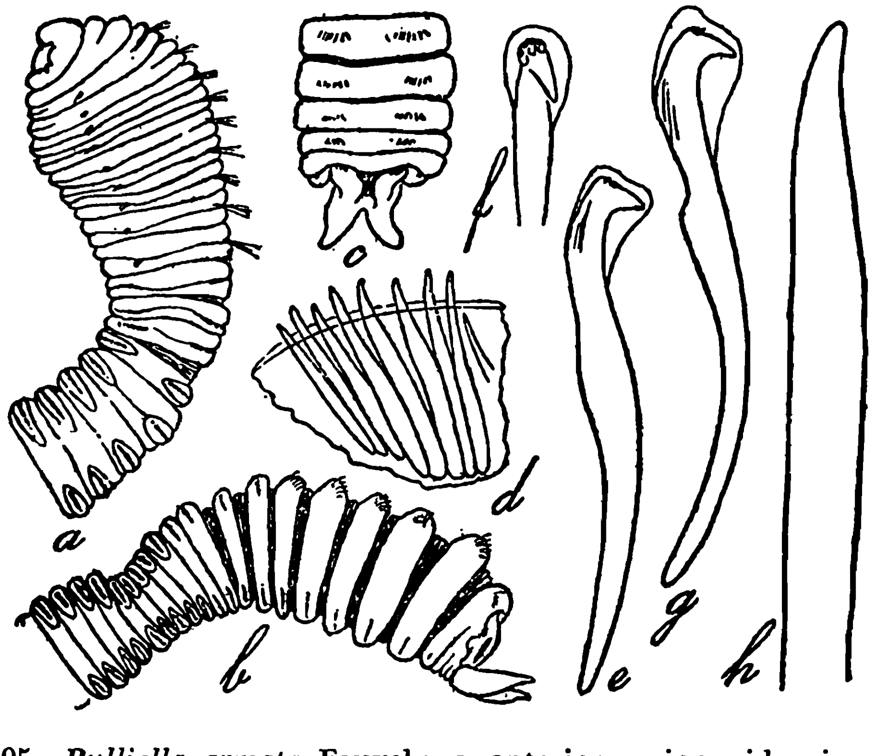

Fig. 195.—*Pulliella armata* Fauvel: *a*, anterior region, side view ×6; *b*, posterior region, side view ×6; *c*, pygidium and last segments, from above ×6; *d*, a row of posterior dorsal acicular spines ×48; *e*, ventral posterior hook ×280; *f*, *g*, dorsal anterior hooks ×280; *h*, tip of a posterior acicular dorsal seta ×280.

pattern and each carrying two dorsal and two ventral bundies of capillary setae, inserted into hollow (retractile?) eminences. In the next three segments, the dorsal and ventral hooks are arranged in transverse rows, faintly raised but not forming true tori. The following abdominal segments bear two short prominent dorsal tori well

apart. The first ventral tori are longer than, and closer to, the dorsal tori; next they become nearly as short as the dorsal tori. The posterior region numbers 8–11 segments, larger than the preceding ones, short, conspicuous, separated from each other by a narrow and deep constriction. They carry, on the dorsal side, stout, bodkin-like acicular setae, arrayed in two rather wide apart rows; and on the ventral side hooks like those of the abdomen. Pygidium on the ventral edge of the last setigerous segment, with two stout, conical, diverging cirri under the anus. On the 4th–5th abdominal segments, a dorsal raised swelling between the tori and somewhat behind them. There are no branchiae.

Length: 15–25 mm. by 2–3 mm.

Remarks: This species is a connecting link between *Scyphoproctus* and the other Capitellids.

Occurrence: Pulli Island, Gulf or Mannar.

Distribution: New Caledonia, Indo-China; India.

Family ARENICOLIDAE Johnston.

To my knowledge no species of *Arenicola* has been, as yet, recorded from the area of India. *Arenicola* species are of rare occurrence in the tropical part of the Indian Ocean.

Family MALDANIDAE Malmgren.

Body nearly cylindrical; segments long and few. Prostomium small, destitute of appendages. A median keel on each side of which is a nuchal groove; often with a more or less rimmed cephalic plate. Buccal segment (peristomium) achaetous. Parapodia biramous, a dorsal setigerous lobe with capillary bristles, a ventral uncinigerous torus. Dorsal and ventral cirri absent. Ante-anal segments often achaetous. An anal funnel with cirri, or an anal plate. Cutaneous glands well developed. Tube membranaceous, coated with sand or mud, or hard, arenaceous.

Key to the genera of MALDANIDAE.

1. **Head with a cephalic plate surrounded by a thickened margin or not .. 2**

   Head without a bordered plate. A foliaceous anal plate ***Petaloproctus*** **Quatrefages, p. 384.**

2. Anal segment having a deep funnel with cirri on the margin; the anus lies in the centre	3
Anal segments forming a smooth plate without cirri ..	5
3. Ventral uncini replaced by acicular setae in a number of anterior segments	*Clymene* Savigny, p. 376.
Ventral acicular setae absent in the first segments	4
4. Uncini, or ventral hooks, in all the setigerous segments	*Axiothella* Verrill, p. 380.
Neither acicular setae nor uncini in the first segment	*Maldanella McIntosh,* p. 383.
5. Cephalic keel long and arched	*Maldane* Grube, p. 382.
Cephalic keel short and flat	*Asychis* Kinberg, p. 385.

Remarks: In the Maldanidae the head, anterior segments, and the pygidium, provide the most important features which differentiate species and genera. *Petaloproctus* and *Nicomache* differ mainly in the structure of their pygidium, whilst the head and anterior segments are almost alike. Incomplete specimens can, therefore, be but exceptionally identified with certainty. Unfortunately, Maldanidae are very brittle worms and are often incomplete in the collections.

Genus CLYMENE Savigny.

A slanting, rimmed, cephalic plate. Acicular ventral bristles in the first three setigerous segments. Several ante-anal achaetous segments. Pygidium funnel shaped, bordered with cirri. Anus at the tip of a cone enclosed in the funnel. Glandular coloured belts on the anterior segments.

Key to the subgenera of Clymene.

Anal cone sunk in the bottom of the funnel	*Euclymene* Verrill, p. 376.
Anal cone protruding. Ventral cirrus much longer than the others ..	*Praxillella* Verrill, p. 380.

Subgenus EUCLYMENE Verrill.

Key to the species of Euclymene.

1. About 40 segments	*santanderensis* Rioja, p. 379.
About 19–21 segments ..	2

2. Cephalic plate with posterior rim crenate	3
Cephalic plate with posterior rim smooth	*insecta* (Ehlers), p. 377.
3. A single hook in anterior ventral rami ..	*annandalei* Southern, p. 377.
2–3 hooks in anterior ventral rami	4
4. Anal cirri equal	*watsoni* Gravier, p. 379.
Anal cirri subequal	*grossa* Baird, p. 378.

363. **Clymene (Euclymene) annandalei** Southern. (Fig. 196, *a, b*).

Euclymene annandalei, Southern, 1921, p. 648, pl. XXVIII, fig. 22, pl. XXIX, fig. 22, *h–k*: Fauvel, 1932, p. 199.

Body with twenty-one segments; 19 setigerous and two achaetous ante-anals. Large concave cephalic plate: rim with two lateral notched sides and a posterior crenate portion. Nuchal grooves rather long, almost parallel. Numerous ocelli. In the three anterior segments in each ventral ramus a single acicular hook with a simple, boldly curved tip. Caudal funnel fringed with short, bluntly rounded cirri, the median ventral cirrus stouter than the others.

Length: 40–80 mm.

Colourless, in spirit. A conspicuous double band of glands on the mid-ventral surface lying over the ventral nerve-cord and running back from the 7th setigerous segment to the caudal ring. Tube of sand grains.

Occurrence: Camorta, Nicobar Islands, Andaman Sea; Chilka Lake.

364. **Clymene (Euclymene) insecta** (Ehlers). (Fig. 196, *i–m*).

Clymene (Euclymene) insecta, Fauvel, 1932, p. 199.

Clymenella insecta, Ehlers, 1904, p. 54, pl. VI, figs. 16–19, pl. VIII, figs. 1–5.

Praxillella insecta, Augener, 1926a, p. 192.

Body with 19 setigerous segments and 3 ante-anals. Dorsal cephalic plate oval, a long keel: rim with two lateral sides notched, posterior part smooth. Nuchal grooves long, parallel. Ventral acicular hooks of the three anterior segments with a slightly smooth tip. Caudal funnel fringed with short cirri, the ventral median cirrus slightly longer than the others.

Occurrence: Vizagapatam, Madras.
Distribution: New Zealand; India.

365. **Clymene (Euclymene) grossa** Baird. (Fig. 196, *f*–*h*)

Clymene grossa Baird, Ehlers, 1901, p. 190, pl. XXV, figs. 1–4: Fauvel, 1932, p. 200.

Body with 19 setigerous segments and one achaetous ante-anal. Cephalic plate oval, with a long keel and elongate parallel nuchal grooves: Posterior part of the rim

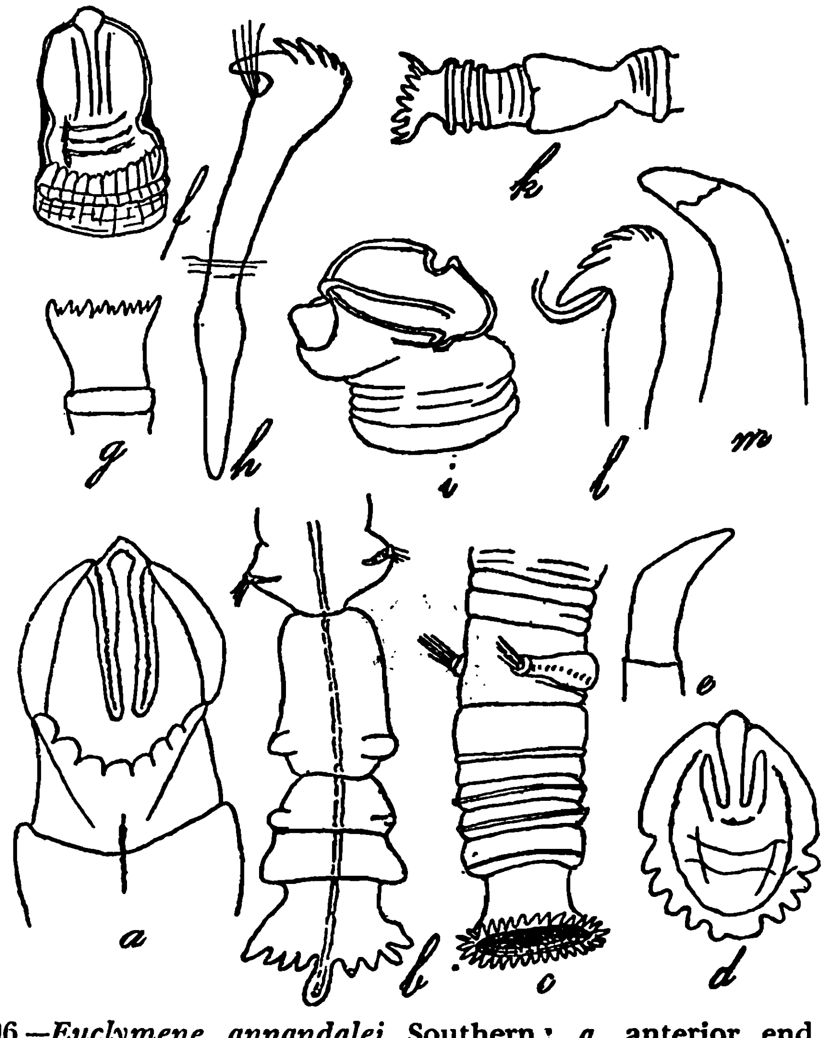

Fig. 196.—*Euclymene annandalei* Southern: *a*, anterior end, dorsal view ×14; *b*, posterior end, ventral view ×10 (after Southern). *E. watsoni* Gravier: *c*, posterior part, side view; *d*, head, dorsal view; *e*, acicular bristle from the 2nd foot (after Gravier). *E. grossa* Baird: *f*, head, dorsal view; *g*, anal funnel ×2; *h*, hook ×210. *E. insecta* (Ehlers): *i*, head ×5; *k*, posterior part ×3; *l*, hook ×270; *m*, top of acicular bristle from the first segments ×270 (after Ehlers).

of the plate denticulated. The five anterior segments are short, with an anterior raised margin, especially the fourth. 2–3 large, yellow, straight acicular hooks in the

ventral rami of the three anterior segments. Anal funnel with short subequal cirri.

Length: 100–125 mm. by 6 mm.

Occurrence: Andaman Islands.

Distribution: Magellan Strait; Andaman Islands.

366. **Clymene (Euclymene) watsoni** Gravier. (Fig. 196, *c–e*).

Clymene watsoni, Gravier, 1906, p. 198, pl. III, figs. 214–216: Fauvel, 1932, p. 200.

Body of 19 setigerous segments; 2–3 ante-anals. Cephalic plate oval, a short keel. Nuchal grooves short, nearly parallel. Posterior rim crenate. Anterior segments short, with a raised anterior margin. 2–3 acicular bent hooks on the 3 anterior ventral rami. Caudal funnel with numerous short, triangular, equal cirri.

Length: about 200 mm.

Colour: the 4th, 5th and 6th setigerous segments deep red.

Occurrence: Sinai Peninsula.

Distribution: Red Sea, Djibouti, Suez.

367 **Clymene (Euclymene) santanderensis** Rioja. (Fig. 189, *a'–h'*).

Clymene santanderensis, Rioja, 1917, p. 1, fig. 1: Fauvel, 1927a, p. 177, fig. 61, *a–h*; 1932, p. 200.

(?) *Clymene monilis*, Fauvel, 1901, p. 89, figs. 31–32.

(?) *Macroclymene monilis*, Augener, 1918, p. 485, fig. 78.

Segments very numerous, about 40. Body very brittle. Cephalic plate oval, rim with two lateral and one posterior notch. Keel and nuchal grooves straight and long. Ventral acicular spines on the first three setigerous segments bent hooks with enlarged manubrium; one in each ramus. One achaetous ante-anal segment. Pygidial funnel fringed with numerous alternating cirri. The first four anterior segments very short. The 7–8 last segments very short, but with setae.

Length: 100–175 mm.

Uncoloured, in spirit.

Occurrence: Vizagapatam.

Distribution: India; West Coast of Africa (?), Santander.

Remarks: Very long fragments, with very numerous segments, from Vizagapatam but not one whole specimen. The identification, although very probable, is nevertheless a little doubtful.

Subgenus PRAXILLELLA Verrill.

368. **Clymene (Praxillella) gracilis** Sars. (Fig. 201, *a—d*).

Clymene (Praxillella) gracilis, Fauvel, 1927a, p. 178, fig. 62; *m—p;* 1932, p. 201: Moore, 1923, p. 238.

Prostomium long and tapering. Ocelli present. Cephalic plate oval, rim notched on the sides and back. Keel and nuchal organs straight and long. 1—3 ventral acicular spines in the first three setigerous segments. 4 achaetous ante-anals. Anal funnel with a longer median cirrus. Anal cone protruding.

Length: 35—75 mm. by 1—2 mm.

Occurrence: Persian Gulf.

Distribution: California; Persian Gulf; Atlantic Ocean, Mediterranean Sea.

Genus AXIOTHELLA Verrill.

Axiothea Malmgren.

A cephalic rimmed plate. Pygidium funnel shaped, fringed with cirri. Without collar. Denticulated uncini from the first setigerous segment.

Key to the species of Axiothella.

Slender bipinnate setae present *australis* Augener, p. 381.
Slender bipinnate setae absent .. *obockensis* (Gravier), p. 380.

369. **Axiothella obockensis** (Gravier). (Fig. 197, *a—e*).

Axiothea oboekensis, Gravier, 1906, p. 206, pl. IV, figs. 221—222.
Axiothella obockensis, Fauvel, 1930a, p. 51, fig. 14, *a—e;* 1932. p. 202.

Long oval, slanting, cephalic plate, with a smooth rim; a long keel and two parallel nuchal grooves. Ocelli present. Two ante-anal achaetous segments. Anal funnel with a long ventral cirrus. A ventral row of numerous small hooks on the first setigerous segment. Long slender bipinnate setae absent.

Length: 10—45 mm.

Occurrence: Gulf of Mannar, Krusadai Island, Kilakarai.

Distribution: India, Red Sea.

370. **Axiothella australis** Augener. (Fig. 197, *f*, *g*).

Axiothella australis, Augener, 1914, p. 65, pl. I, figs. 7—8; Fauvel, 1930a, p. 52, fig. 14, *f*—*g*.
Axiothea, spec., Gravely, 1927, p. 26.

Body of 18 setigerous segments, two achaetous anteanals. Cephalic plate oval, slanting, relatively short, rim crenulate or notched; a long keel, two straight nuchal

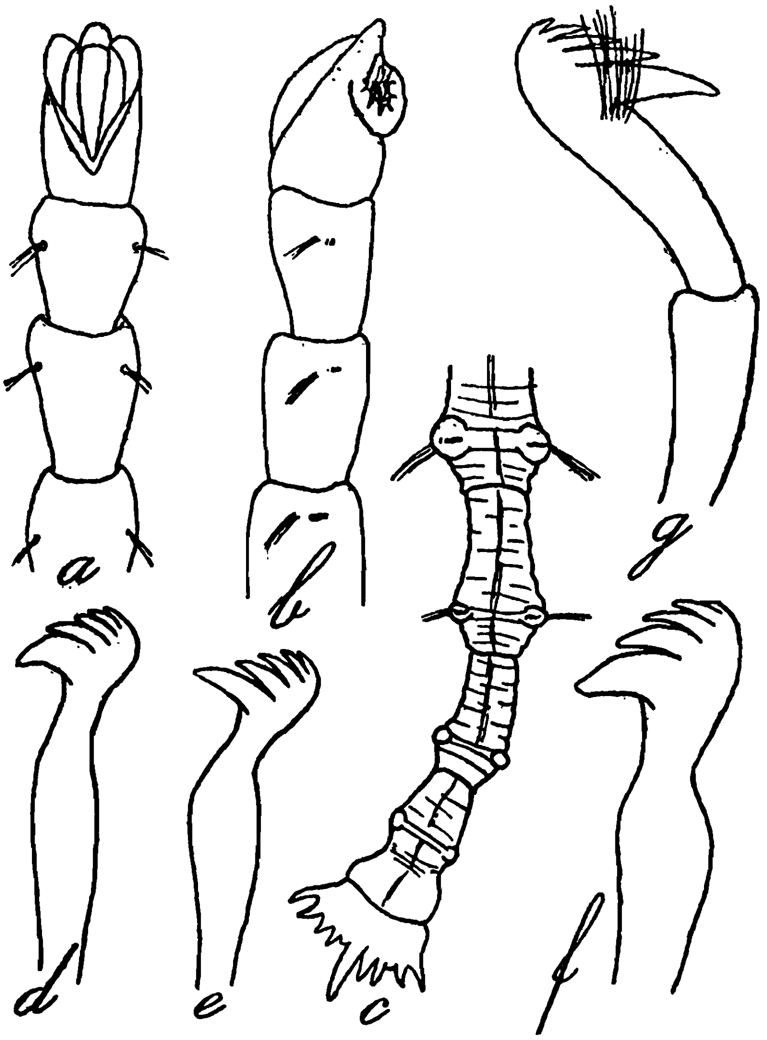

Fig. 197.—*Axiothella obockensis* (Gravier): *a*, *b*, anterior region, dorsal and side views ×9; *c*, posterior region, ventral side ×9; *d*, *e*, hooks from the first setigerous segments ×550. *A. australis* Augener: *f*, hook from the first segment ×550; *g*, hook from the 10th segment ×550.

organs. Anal funnel with alternating cirri, no longer ventral cirrus. Hooks of the first segment less numerous, with strongly curved manubrium. Long slender bipinnate setae present.

Length: 19—40 mm. by 2 mm.

Occurrence: Gulf of Mannar, Krusadai Island, in a colony of *Polydora caeca,* and a number of specimens with *Mesochaetopterus.*

Distribution: South Australia; India.

Genus MALDANE Grube.

Cephalic keel convex, arched; rim divided into three parts by two deep lateral notches. Nuchal grooves short. Anal plate oval, slanting, with the rim notched on each side. Anus dorsal; ante-anal segments achaetous. Anterior segments without collar. Ventral setae absent on the first segment. Dorsal setae of three kinds. Uncini from the second setigerous segment. Glandular belts. Tube coated with mud.

371. **Maldane sarsi** Malmgren. (Fig. 198, *a—i*)

Maldane sarsi, Arwidsson, 1906, p. 151, pl. VII, figs. 192—199: Fauvel, 1927a, p. 197, fig. 69, *a—i;* 1932, p. 202: Monro, 1937, p. 307: Augener, 1927a, p. 227: Mesnil and Fauvel, 1939, p. 14, figs. 9, 10.

(?) *Maldane cristata* Treadwell, Monro, 1937, p. 306, fig. 23.

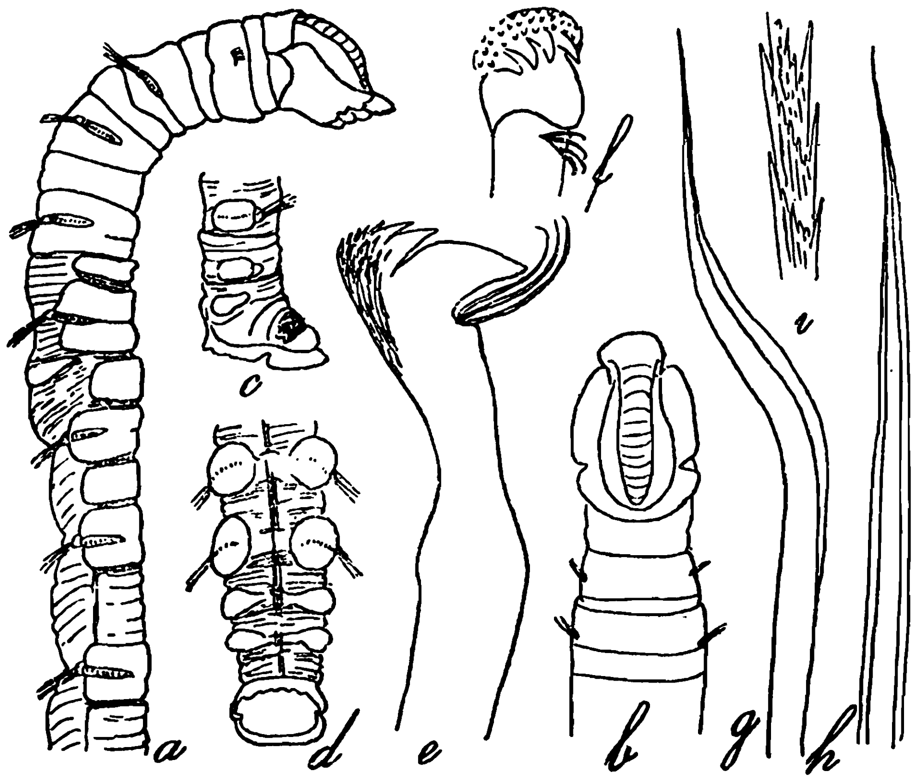

Fig. 198.—*Maldane sarsi* Malmgren: *a,* anterior part, side view ×3; *b,* head, from above ×4; *c, d,* posterior part, side and ventral view ×3; *e, f,* hook, side and front view ×330; *g,* winged kneed seta ×330; *h,* straight winged seta ×330; *i,* part of a spinous bristle ×390.

Body of 19 setigerous segments, two achaetous ante-anals. Cephalic keel strongly arched. Rim smooth but notched on each side. Nuchal grooves short, diverging, straight or faintly curved. Anal plate oval, slanting, with the rim notched on each side, smooth or faintly crenate on the ventral side. Anus dorsal, puckered under the anal plate border. No acicular hooks on the anterior segments. Uncini with a strong hooked end. Numerous denticles on the vertex, and sub-rostral filaments. A thick tube of mud.

Length: 50—120 mm. by 2—3 mm.

Colour: Anterior part more or less spotted with brown marks.

Occurrence: Andaman Sea; Bay of Bengal; Laccadive Sea; Arabian Sea; Gulf of Oman.

Distribution: Pacific Ocean, California, Japan, Australia, Malayan Seas; Indian Ocean; Atlantic Ocean, North Sea; Antarctic Ocean.

Remarks: The variety *tropica* Monro differs only from the type in the absence of a glandular crescent on the dorsal surface of the 5th setigerous segment, but that is also sometimes absent in specimens of *M. sarsi* from the north seas. *Maldane cristata* Treadwell has a high keel, a deep cephalic pouch and a denticulate ventral border of the anal plate, but these characters are also frequently met with in typical *M. sarsi*, the anal plate being very variable. Moreover, the cephalic pouch is always present, more or less deep but often inconspicuous, its anterior dorsal edge being appressed on the head, especially on specimens dead in their tubes.

Genus MALDANELLA McIntosh.

A rimmed cephalic plate. Nuchal grooves straight, parallel. Anal funnel fringed with cirri, with anus at the bottom. Ventral setae and hooks absent on the first setigerous segment. Uncini from the 2nd setigerous segment. Anterior segments short, *collarless*. Glandular belts on the first 7 segments.

372. Maldanella harai (Izuka). (Fig. 199, *i—n*).

Maldanella harai, Fauvel, 1914b, p. 260, pl. XXIII, fig. 1; 1927a, p. 186, fig. 64, *i—n* (Synonymy); 1932, p. 203.

Clymene harai, Izuka, 1902, p. 111, pl. III, figs. 9—12.

Axiothea campanulata, Moore, 1903, p. 485, pl. XXVII, fig. 99; 1906, p. 239.

Prostomium eyeless. Cephalic plate slanting, with a smooth rim faintly, or not, notched. Keel and nuchal grooves extending to about half the length of the plate. 19 setigerous segments and 2 achaetous ante-anals. Anterior border of the first 7 setigerous segments glandular. Dorsal setae of two kinds: (1) winged, and (2) slender,

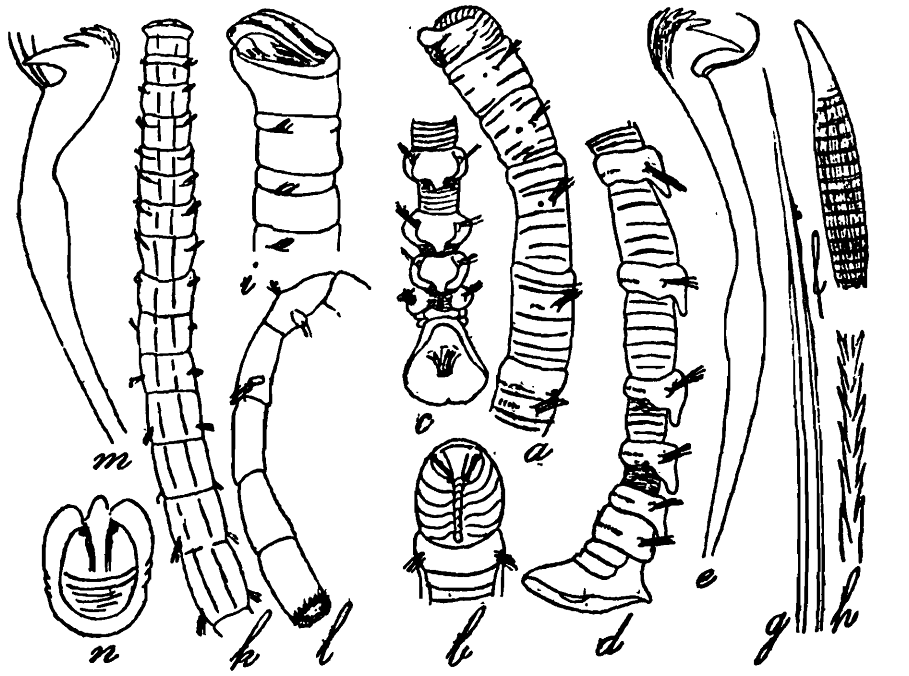

Fig. 199.—*Petaloproctus terricola* Quatrefages: *a*, anterior part ×2.5; *b*, head from above; *c*, posterior part, dorsal view ×2.5; *d*, posterior part, side view ×2.5; *e*, ventral hook ×120; *f*, anterior acicular hook ×24; *g*, winged bristle ×120; *h*, part of a pennate bristle ×400. *Maldanella harai* (Izuka): *i*, head, side view; *k*, anterior part ×2; *l*, posterior region ×2 (after Izuka); *m*, ventral hook ×120; *n*, head, from above ×4.

smooth capillaries. Uncini from the 2nd setigerous segment. Anal funnel elongated, fringed with small, nearly equal cirri. Tube of mud.

Length: 70–180 mm. by 3–6 mm.

Colour: Decoloured in spirit.

Occurrence: Bay of Bengal, 637–800 fms.; Laccadive Sea, 1,154 fms.

Distribution: Japan; Bay of Bengal, Laccadive Sea; Atlantic Ocean.

Genus PETALOPROCTUS Quatrefages.

Head arched, without cephalic plate. Nuchal grooves short. A large anal foliaceous plate, without cirri, surrounding the anus. Ventral acicular bristle on the first

three segments. Anterior segments short, middle ones more elongated, posterior ones shorter, with a dorsal fleshy lobe. Achaetous ante-anals rudimentary. Glandular belts on the anterior segments. Hard, thick tube of concrete sand.

373. **Petaloproctus terricola** Quatrefages. (Fig. 199, *a*–*h*).

Petaloproctus terricola, Fauvel, 1927a, p. 194, fig. 68, *a*–*i*, (Synonymy); 1932, p. 203.
Maldane cristagalli, Claparède, 1868, p. 457, pl. XXVI, fig. 4.

Head rounded, without any trace of rim. Keel arched. Nuchal grooves short and diverging. 22 setigerous segments; achaetous ante-anals wanting. A large ventral spine on the first three setigerous segments. Dorsal setae of three kinds: (1) winged, (2) slender capillaries, (3) long, slender, filiform, barbed threads. A large raised fleshy pad ending backwards in a blunt lobe on the dorsal side of the last 6—7 segments. Last segment very short. Tube thick, hard, sandy.

Length: 150—200 mm. by 3—4 mm.

Colour: Anterior part red, spotted white, 2nd—3rd segment pink, the next four red-brown with clear belts. Posterior region dark.

Occurrence: Koweit Harbour.

Distribution: Malay Seas; Indian Ocean, Persian Gulf; Atlantic Ocean, Mediterranean Sea.

Genus ASYCHIS Kinberg.

Cephalic plate, rim divided into three parts by two deep lateral notches. Keel flat and short. Nuchal grooves curved. Anus dorsal, above the large oval foliaceous, more or less lobed, plate. First ventral setigerous segment without ventral setae or hooks. Uncini from the 2nd setigerous segment. Anterior segments short. Achaeous ante-anals short, rudimentary. Dorsal setae of three kinds.

Key to the species of Asychis.

1. Anal plate with long filiform processes, simple or forked	2
Anal plate without filiform processes	3
2. Anal plate with 3 long filiform processes, simple or forked. Lateral sides of the cephalic plate smooth , ..	*trifilosa* Augener, p. 388.

Anal plate with several sharp slender processes. Cephalic plate denticulate	*gotoi* (Izuka), p. 387.
3. Anal plate foliaceous, dorsal part broad, with triangular, inrolled, lateral lobes; ventral part bilobed, smooth	*gangeticus* Fauvel, p. 389.
Anal plate with dorsal and ventral lobes smooth or denticulate	4
4. Cephalic plate rim smooth	*theodori* Augener, p. 386.
Cephalic rim denticulate	*disparidentata* (Moore), p. 387.

374. Asychis theodori Augener. (Fig. 200, *c–f*).

Asychis theodori, Augener, 1926a, p. 183, fig. 6: Fauvel, 1932, p. 204.

Cephalic plate rim divided into three smooth lobes by the deep lateral notches. First segment achaetous,

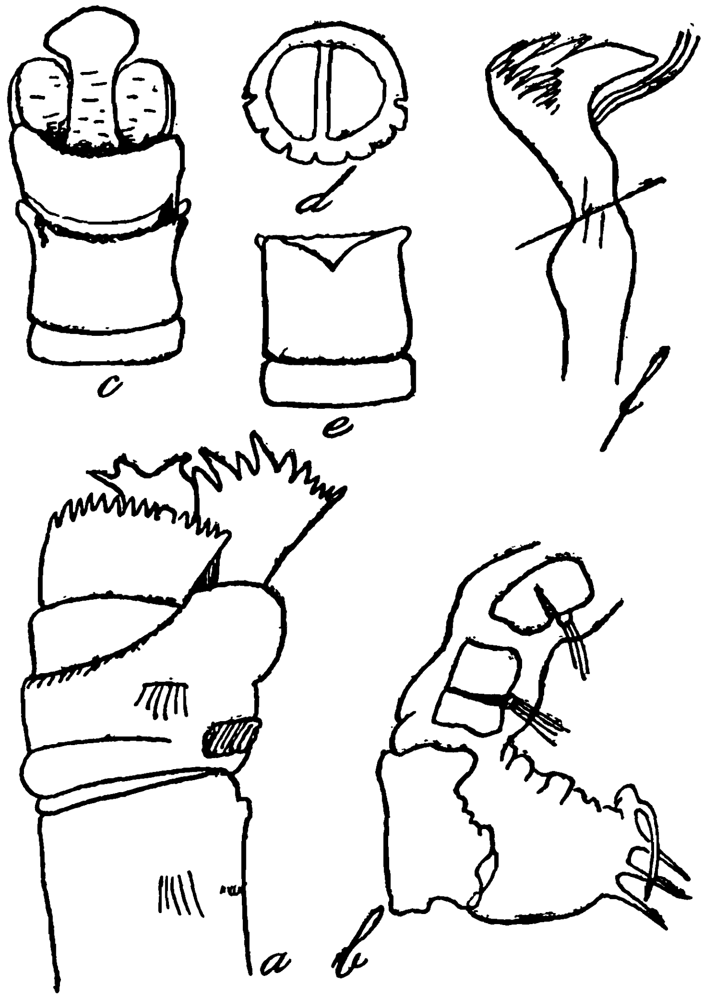

Fig. 200.—*Asychis gotoi* (Izuka): *a*, anterior part, side view ×16; *b*, anal funnel, side view ×10. *A. theodori* Augener: *c*, head, from above ×14; *d*, anal plate ×14; *e*, collar, ventral view ×14; *f*, ventral hook from 2nd foot ×450 (after Augener).

with anterior border drawn out into a collar notched on each side and in the middle of the ventral lobe. 19 setigerous segments and two achaetous ante-anals. Dorsal lobe of the rounded anal plate smooth, ventral lobe bluntly denticulated.

Length: 54 mm. by 1.5 mm.

Colour: greenish ochraceous.

Occurrence: Persian Gulf, 25 fms.

Distribution: New Zealand; Persian Gulf.

375. Asychis gotoi (Izuka) (Fig. 200, *a—b*)

Asychis gotoi, Fauvel, 1932, p. 205; 1934, p. 57, figs. 2—3; 1939, p. 16, fig. 11: Mesnil and Fauvel, 1940, p. 22.
Maldane gotoi, Izuka, 1902, p. 109, pl. III, figs. 1—8.
Maldane coronata, Moore, 1903, p. 483.

Rim of the cephalic plate divided into three lobes by deep lateral notches: dorsal lobe serrated, lateral lobes fringed with cirri of unequal lengths. First segment produced into a collar notched on each side. 19 setigerous segments. No achaetous ante-anals. The dorso-posterior margin of the anal plate is expanded into a petaloid plume having six to twelve corners, each of which is prolonged into a long slender cirrus. Tube membranous coated with mud.

Length: 80—120 mm. by 6 mm.

Occurrence: Andaman Sea, 405 fms.; Laccadive Sea, 1,022 fms.

Distribution: Japan, Java; Andaman Sea, Laccadive Sea; Adriatic Sea.

376. Asychis disparidentata (Moore)

Asychis disparidentata, Fauvel, 1932, p. 205.
Maldane disparidentata, Moore, 1904, p. 494, pl. XXXVIII, figs. 32—35; 1909, p. 282.

Cephalic plate broadly oblong, elliptical; frontal ridge low, broad, inconspicuous, equal to one-third of the cephalic plate. Nuchal grooves short. Posterior lobe of the cephalic rim divided into about 15 low, broad, truncate teeth, irregular and not constant; lateral lobes considerably more elevated and bearing 5 or 6 larger, more prominent, rounded teeth. Anterior margin of the first setigerous segment produced into a collar. 19 setigerous segments, an achaetous ante-anal. Anal plate with a dorsal lanceolate lobe arched over the anus and a ventral lobe smooth or slightly irregular, but entirely without lobes or processes.

Length: 40 mm. by 2 mm.
Occurrence: Cape Comorin, 902 fms.
Distribution: California; India.
Remarks: May be a mere variety of *A. biceps*.

377 **Asychis trifilosa** Augener. (Fig. 201, *g–h*)

Asychis trifilosa, Augener, 1926, p. 187, fig. 7: Fauvel, 1932, p. 205: Mesnil and Fauvel, 1939, p. 17, fig. 12.

Lateral lobes of the cephalic rim smooth, dorsal lobe faintly and finely crenate or smooth. First setigerous segment not produced into a collar, but one is present on the

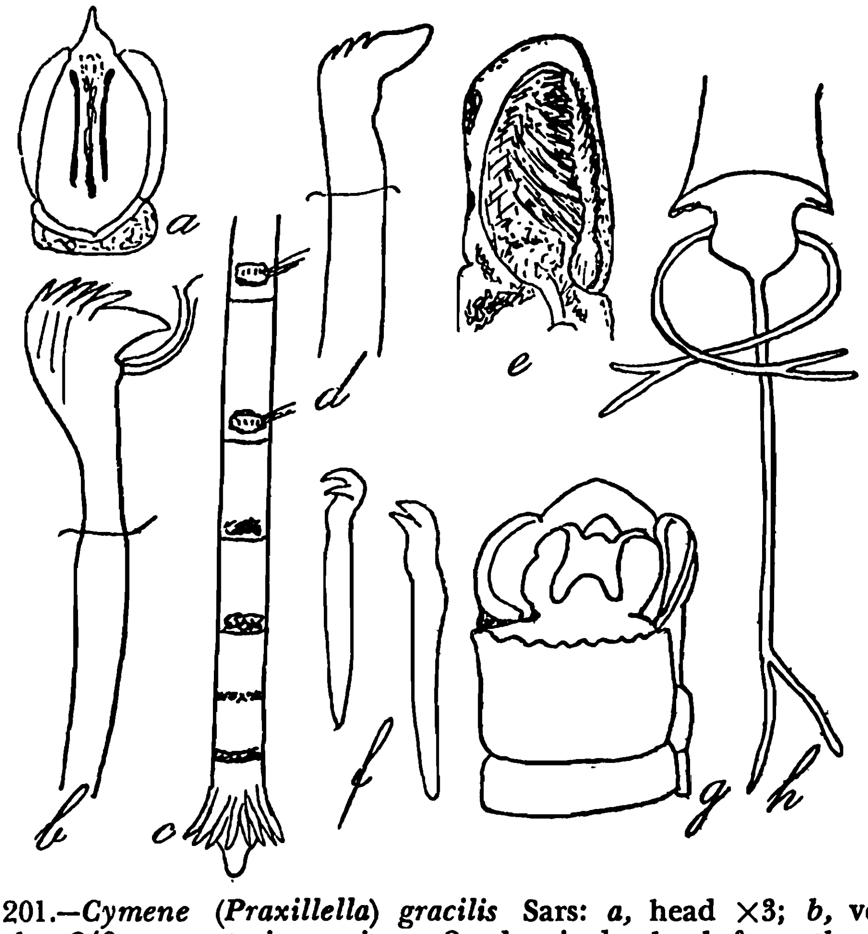

Fig. 201.—*Cymene* (*Praxillella*) *gracilis* Sars: *a*, head ×3; *b*, ventral hook ×240; *c*, posterior region ×2; *d*, acicular hook from the first foot ×80. *Myriochele picta* Southern: *e*, head, side view ×56; *f*, hooks ×1385 (after Southern). *Asychis trifilosa* Augener: *g*, head, dorsal view ×8 (after Augener); *h*, anal funnel, enlarged.

5th. 19 setigerous segments; one (?), or none, ante-anal. Anal plate with a dorsal petaloid lobe bearing three very long filiform cirri, simple or forked at the tip; ventral lobe narrow and smooth, forming a hollow cup. Anus dorsal and wrinkled.

Length: 160 m. by 4 mm.

Occurrence: Gulf of Oman, in greenish brown mud.

Distribution: New Zealand; Malay Archipelago; Gulf of Oman.

378. Asychis gangeticus Fauvel. (Fig. 202, *a–i*)

Asychis gangeticus, Fauvel, 1932, p. 206, pl. VIII, figs. 1–9.

Body nearly cylindrical, truncate at both ends. 19 setigerous segments; achaetous ante-anals absent. Cephalic plate rounded, slanting, with a membranous rim divided into three parts by deep lateral notches; posterior and

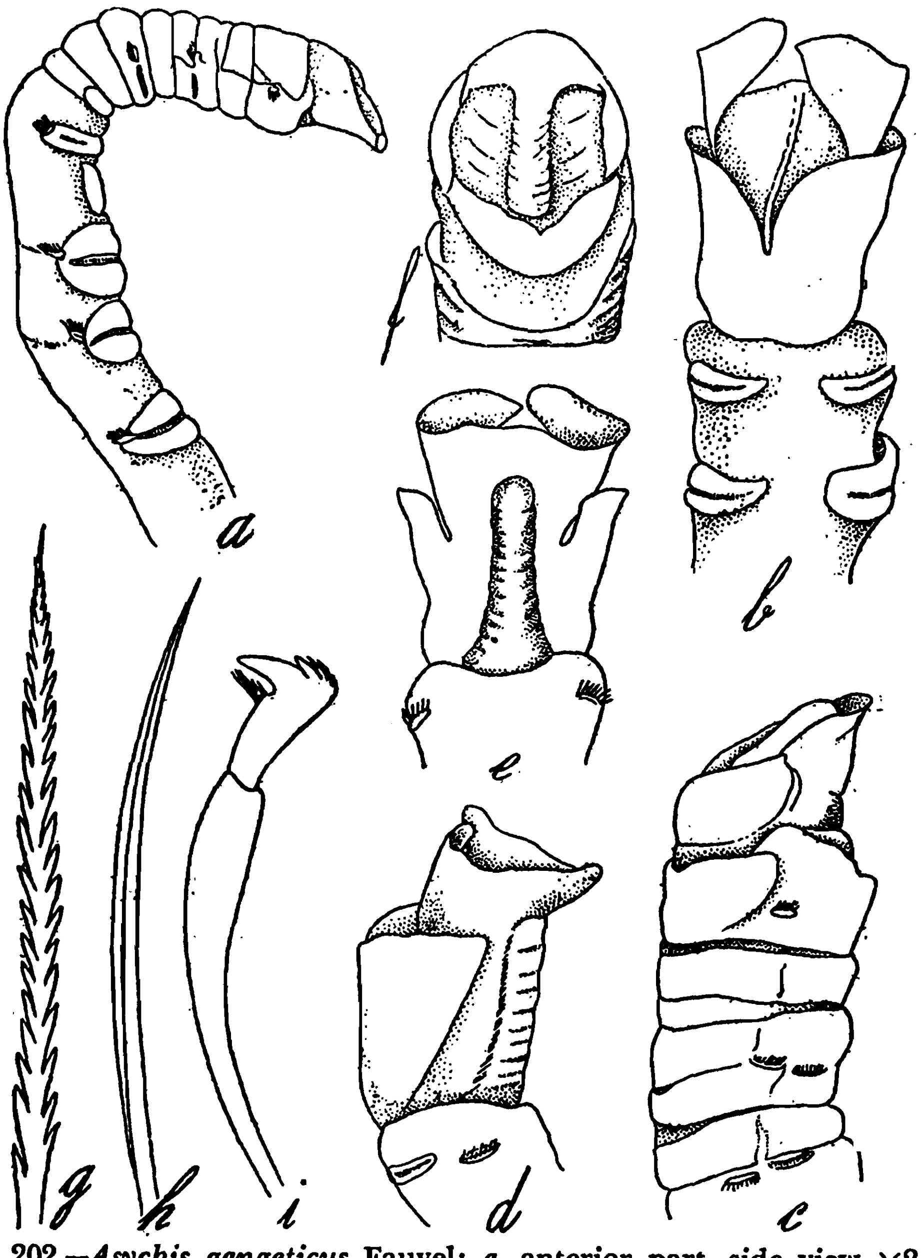

Fig. 202.—*Asychis gangeticus* Fauvel: *a*, anterior part, side view ×2.5; *b*, pygidium, ventral view ×2.5; *c*. anterior end, side view ×4; *d*, pygidium, side view ×4; *e*, pygidium, dorsal view ×4; *f*, head ×4: *g*, barbed seta ×250; *h*, winged seta ×50; *i*, hook ×105 (Fauvel 1932).

lateral parts smooth, faintly wavy. Prostomium flattened, broadly rounded in front. Keel broad, long and depressed. Nuchal grooves transversely curved. A longitudinal furrow on each side of the achaetous buccal segment. Anterior rim of the first setigerous segment produced into a collar sheathing the buccal segment, deeply notched on either side. Buccal segment and the first three setigerous segments somewhat uniformly glandular, 4th and 6th with broad ventral glandular pads, next with only large, raised, glandular tori. There is no glandular dorsal crescent-shaped pad on the 5th setigerous segment. Dorsal setae of three kinds: (1) long winged setae, slightly bent; (2) slender setae, barbed at the tip and shorter, and (3) very slender smooth capillary setae. On the following segments a transverse row of uncini, whose large fang is crested with a rather large tooth and numerous tiny denticles. The subrostral barbs are few and slender, the manubrium is clearly enlarged. The last two setigerous segments are very short, with raised glandular tori; the last one reaches the base of the caudal funnel. Pygidium with: (1) a broad triangular, foliaceous dorsal lobe with a rounded border, lateral borders rolled inwards, and a dorsal keel ending in a rounded valve above the anus, and (2) a foliaceous ventral lobe divided by a deep indentation into two lateral lobes sheathing the base of the rolled in dorsal lobe. The length of the pygidial apparatus equals that of the last three setigerous segments.

Length: 140 mm. by 5—6 mm.

Colour: in spirit yellowish brown with glandular bands and whitish tori.

Occurrence: Gangetic Delta. A single specimen.

Incertae sedis

NICOMACHE TRUNCATA Willey

Nicomache truncata Willey, 1905, p. 290, pl. V, fig. 122—123.

As Willey's specimen from Ceylon is only an anterior fragment of 6 segments, in the absence of the posterior end and anal plate it is not possible to decide with any certainty whether it belongs to the genus *Nicomache* Malmgren or the genus *Petaloproctus* Quatrefages.

Family OWENIDAE Rioja.

Ammocharidae Malmgren.

Body cylindrical, anterior segments longer than broad, posterior ones shorter. Prostomium fused with the buc-

cal segment (peristomium), devoid of appendages or ending in a lobed membrane. Dorsal setae capillary, ventral uncini very numerous, very small, set in transverse rows, and with a bent hooked tip. Anal cirri absent. Tube coated with sand or shell fragments.

Key to the genera of OWENIIDAE.

Prostomium rounded, devoid of appendages	*Myriochele* Malmgren, p. 391.
Prostomium bearing a branchial laciniate membrane	*Owenia* Delle Chiaje, p. 391.

Genus OWENIA Delle Chiaje.

Prostomium bearing a branchial laciniate membrane. Buccal segment achaetous. The first three setigerous segments long and without uncini. Dorsal setae slender, spinous. Uncini bidentate. Pygidium bilobed. Glandular belts and spinning glands.

379. Owenia fusiformis Delle Chiaje. (Fig. 208, *a–f*).

Owenia fusiformis, Gravier, 1906, p. 294; Augener, 1914, p. 77; Fauvel, 1927a, p. 203, fig. 71 *a–f* (Synonymy); 1932, p. 208.

Ammochares assimilis, Malmgren, 1867, p. 210, pl. XII, fig. 65.

Ammochares orientalis Grube, Willey, 1905, p. 290, pl. V, figs. 124–125.

Uncini with an elongated manubrium and a curved hook with two parallel teeth. The two ante-anal segments without dorsal setae. Tube membranaceous, open and tapering at both ends, coated with overlapping sand grains and flat bits of shells, imbricated.

Length: 50–100 mm. by 2–3 mm.

Colour: in life, greenish or yellowish with paler transverse glandular belts.

Occurrence: Mergui Archipelago; S. of Ceylon, 1,500 fms.; Tuticorin Pearl Bank.

Distribution: Pacific, Indian and Atlantic Oceans. Cosmopolitan.

Genus MYRIOCHELE Malmgren.

Body slender, cylindrical, divided into two regions. Prostomium devoid of appendages. Mouth oblique, subventral. Peristomium achaetous. First three segments

without uncini. Dorsal setae capillary, slender, spinulose. Uncini bidentate, Pygidium obtuse-conical. (Fig. 203, *g–m*).

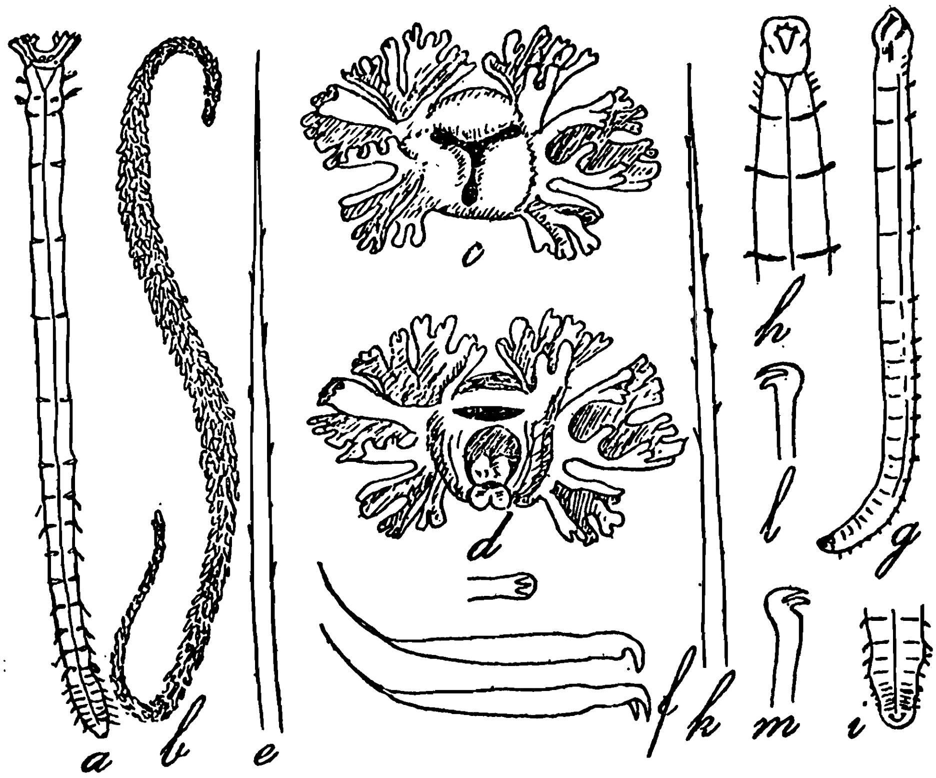

Fig. 203.—*Owenia fusiformis* Della Chiaje: *a*, natural size; *b*, tube, natural size; *c*, *d*, head from above, mouth closed or opened, with the labial organ, much enlarged (after Watson); *e*, dorsal bristle ×300; *f*, uncini, front and side view ×550. *Myriochele heeri* Malmgren: *g*, enlarged; *h*, anterior part, ventral view; *i*, posterior region; *k*, dorsal bristle ×470; *l*, *m*, uncini ×550 (a species hardly distinct from *M. picta*).

380. **Myriochele picta** Southern. (Fig. 201, *e*, *f*)

Myriochele picta, Southern, 1921, p. 638, pl. XXXI, fig. 30.

Prostomium and peristomium fused in a rounded eyeless mass. Behind the mouth, a clavate diverticulum. The three thoracic segments carry only capillary setae. The first abdominal segment is as long as the three thoracic segments, the second is still longer and is the largest of the body. The succeeding eight diminish only slightly in length, but the three posterior are much shorter. Dorsal capillary setae and ventral hooks in all the abdominal segments. The hooks are bidentate and arranged in irregular transverse rows. Five pairs of thread glands in the first five segments. Tubes cylindrical, covered with small quartz grains.

Length: 3–4 mm.

Colour: on the back of the head, a conspicuous patch of reticulate purplish-brown pigment. A transverse dorsal band at the posterior end of the buccal segment.

Occurrence: Chilka Lake, on a muddy bottom.

Family SABELLARIIDAE Johnston.

HERMELLIDAE Auct.

Body divided into three regions. Prostomium not conspicuous, between two large opercular stalks bearing modified setae (paleae) set in concentric circles. Two palps. Anterior region of two short segments with rudimentary feet, and 3—4 parathoracic biramous segments with oar-shaped setae; abdominal region with unciniger-ous dorsal rami, and ventral rami with capillary setae. Simple gills. A caudal tail-like unsegmented, achaetous and apodous region. Hard, thick, sandy tube.

Key to the genera of SABELLARIIDAE.

Two concentric rows of opercular paleae ..	*Pallasia* Quartrefages, p. 398.
Three concentric rows of opercular paleae ..	*Sabellaria* Lamarck, p. 393.

Genus SABELLARIA Lamarck.

Opercular stalks short, each bearing three concentric rows of golden paleae. Two small elongated palps. Numerous filiform tentacles on the ventral side of the opercular stalks. Three biramous parathoracic segments with oar-shaped setae. Dorsal falciform gills. In the abdomen broad dorsal pinnules with pectinate uncini and ventral capillary setae. Tail smooth, achaetous. Thick tube of firmly cemented sand grains.

Key to the genera of Sabellaria.

1. Outer opercular paleae with a slender, elongated, barbed process. Paleae of the middle row cup-shaped, smooth	*spinulosa* Leuckart, p. 394.
Outer opercular paleae without median slender, barbed process ..	2
2. Tip of the outer paleae ending in a long, slender, smooth spine	*cementarium,* Moore, p. 395.

Tip of the outer paleae gradually decreasing into a barbed point. Edge of the middle paleae denticulated .. *pectinata* Fauvel, p. 396.

381. **Sabellaria spinulosa** Leuckart. (Fig. 204, *a–i*)

Sabellaria spinulosa, Fauvel, 1927a, p. 208, fig. 73, *a–p*. (Synonymy); 1932, p. 209.

Sabellaria alcocki, Gravier, 1909, p. 298, pl. VIII, fig. 11–23; Fauvel, 1911, p. 415.

Sabellaria spinulosa, var. *alcocki*, Fauvel, 1914, p. 144; 1932, p. 209.

Outer paleae broad, paddle-shaped, with 5–9 straight teeth and a median, slender, barbed process. Middle paleae geniculate, cup-shaped, smooth, short or elongated

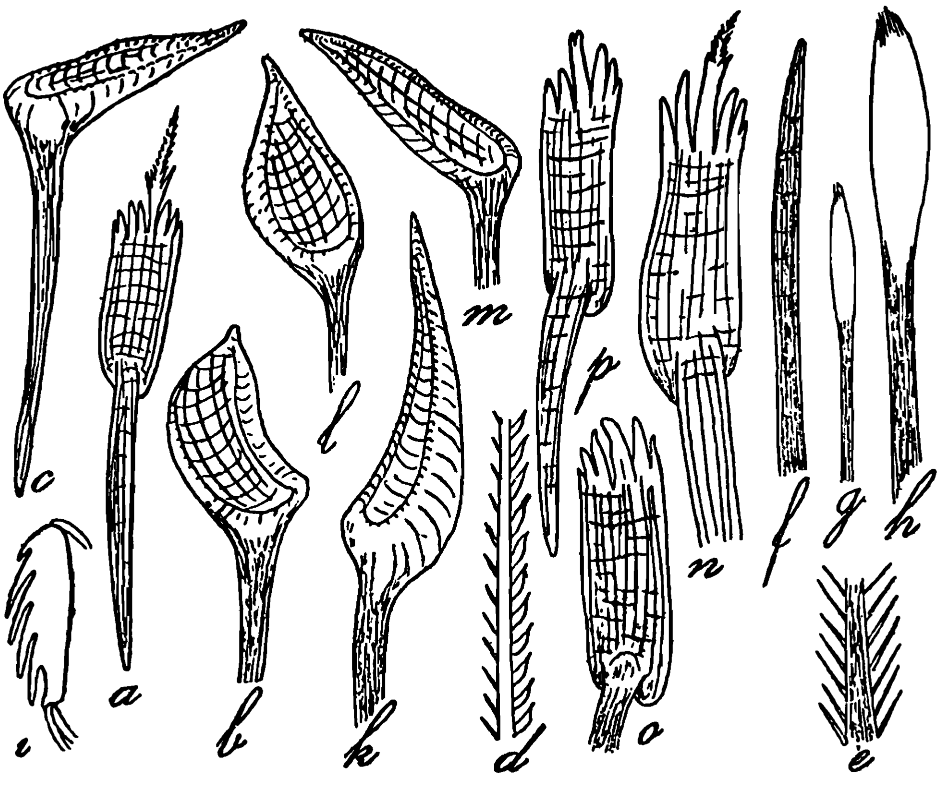

Fig. 204.—*Sabellaria spinulosa* Leuckart: *a*, outer palea ×27; *b* intermediate hooded palea ×27; *c*, inner palea ×27; *d*, detail of an abdominal capillary bristle ×310; *e*, part of a bipectinate bristle from the first setigerous segment ×310; *f*, dorsal interpeduncular hook ×105; *g*, ventral parathoracic bristle ×93; *h*, dorsal oar-shaped parathoracic bristle ×93; *i*, uncinus ×93. var. *alcocki* Gravier: *k*, raised intermediate palea ×27; *l*, intermediate hooded palea, front view ×27; *m*, inner palea ×27. var. *gravieri* Fauvel: *n*, outer, spinous palea from the dorsal side of the operculum ×23; *o*, outer smooth palea ×27. var. *intoshi*: *p*, outer palea with median bifid tooth ×27.

and erect. Inner paleae spoon-shaped. 2–3 pairs of dorsal acicular bristles. A triangular finger-like cirrus between the opercular stalks.

Several varieties of this species have been described: one of these is found in Indian waters.

var. **alcocki** Gravier. (Fig. 204, *k–m*).

Middle paleae alternately long and short, erect, or all elongated.

Occurrence: Mergui Archipelago, Paway Island; Matlah River, Gangetic Delta.

Distribution: Indo-China; Indian Ocean, Persian Gulf, Atlantic Ocean.

382. **Sabellaria cementarium** Moore. (Fig. 205, *a–g*)

Sabellaria cementarium, Moore, 1906, p. 248, pl. XII, figs. 45–51: Fauvel, 1932, p. 209, fig. 34.

Outer paleae ending in a long slender, sharp, smooth spine arising between shorter, smooth spines. Middle paleae short, smooth, spoon-like. Inner paleae hollow, elongated, smooth or denticulate along the edge. Tube

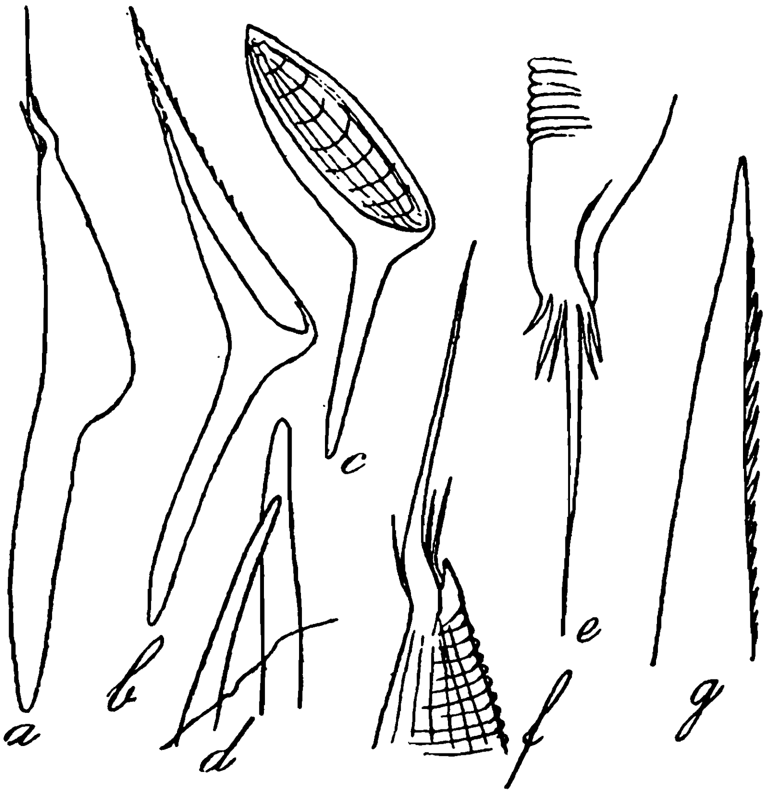

Fig. 205.—*Sabellaria cementarium* Moore: *a*, outer palea ×65; *b*, inner palea ×65; *c*, intermediate palea ×65; *d*, dorsal interpeduncular hooks ×150; *e*, *f*, tips of outer paleae ×150; *g*, tip of an inner palea ×150.

very thick, hard, made of large translucent quartz grains firmly cemented together; with an inner diameter of about 3 mm.

Occurrence: Tuticorin beach.

Distribution: Pacific Ocean (Alaska); India.

383. Sabellaria pectinata Fauvel. (Fig. 206, *a–g*).

Sabellaria pectinata, Fauvel, 1928b, p. 163, fig. 3, *a–g;* 1930a, p. 53, fig. 15; 1932, p. 210.

Outer paleae having broad paddle-shaped tips with a central triangular spike bearing numerous lateral spines. The middle paleae are cup-shaped, with a short smooth

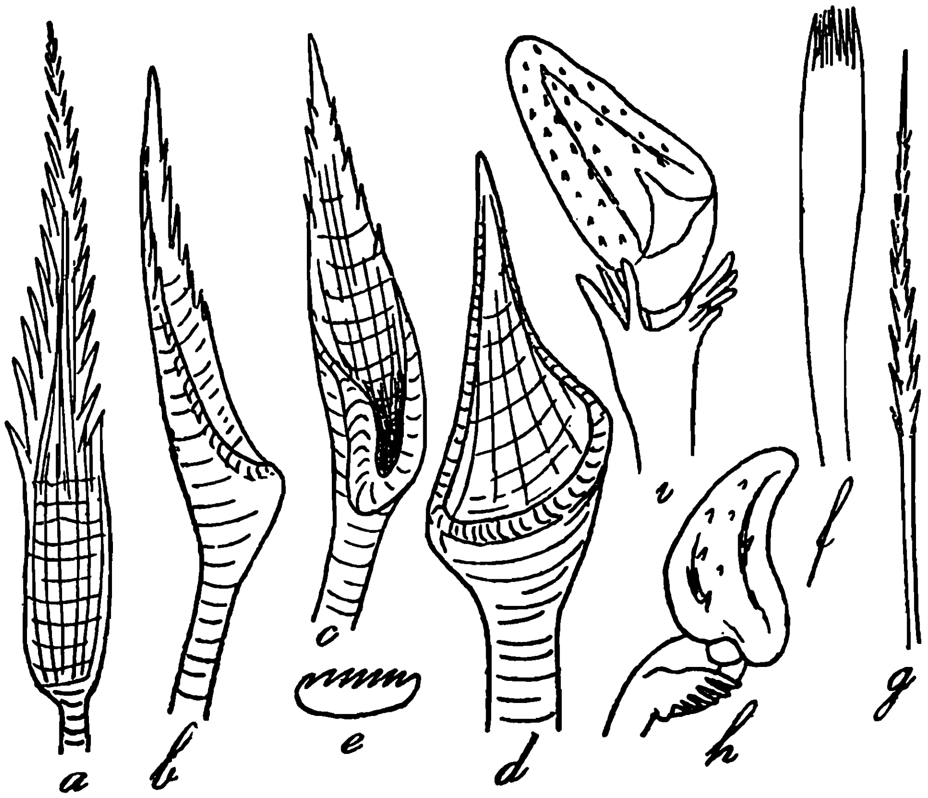

Fig. 206.—*Sabellaria pectinata* Fauvel: *a,* outer palea ×62; *b, c,* inner paleae ×78; *d,* intermediate palea ×78; *e,* uncinus ×310; *f,* oar-shaped bristle ×155; *g,* capillary bipectinate bristle ×155. *Pomatostegus polytrema* Philippi, var *indica* Fauvel: *h, i,* two kinds of operculum, side and front view ×27.

tip. Inner paleae elongated, spoon-shaped with spinose edges. A median cirrus between the opercular lobes. Tube of somewhat minute, transparent, sand grains held together by a white cement.

Length: 10—12 mm., tail not included, by 1—1.5 mm.

Colour: Pigment spots on the anterior part, buccal tentacles dotted with red-brown.

Remarks: Differs from *S. spinulosa* Leuckart in the form of its operculum.

Occurrence: Gulf of Mannar, Krusadai, Shingle Island.

var. **intermedia** Fauvel. (Fig. 207, *a–h*)

Sabellaria pectinata var. *intermedia*, Fauvel, 1932, p. 210, fig. 35.

Opercular pillars fused along about two-thirds of their length. There are a few dorsal acicular bristles and a median cirrus between the opercular lobes. The first

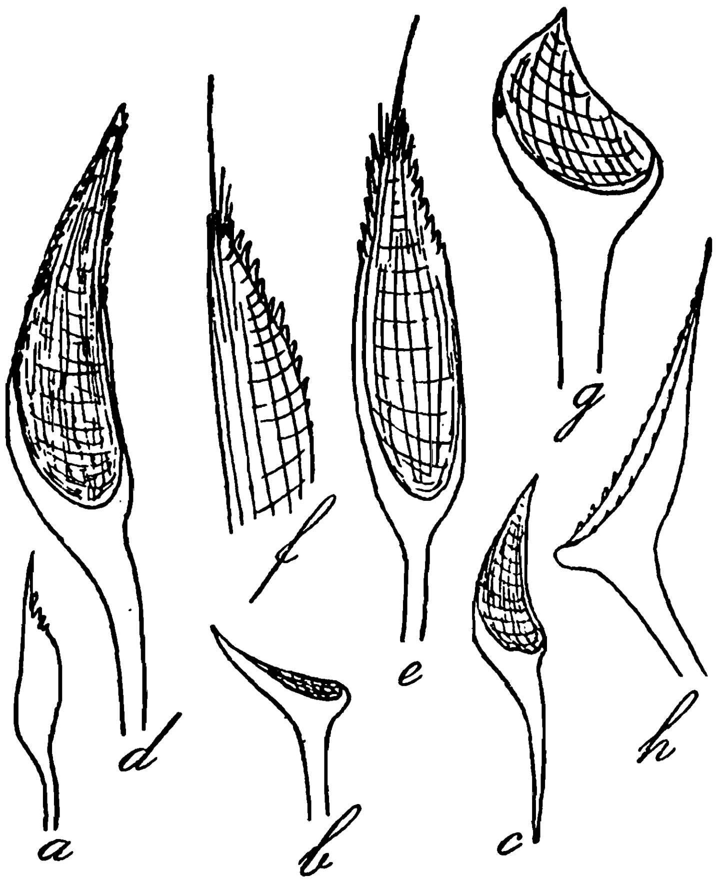

Fig. 207.—*Sabellaria pectinata* Fauvel: var. *intermedia* Fauvel: *a, b, c,* outer, inner and intermediate paleae, drawn to the same scale ×65; *d,* intermediate elongated palea ×120; *e,* outer palea ×150; *f,* tip of an outer palea, side view ×150; *g,* short intermediate palea ×120; *h,* inner palea ×120.

four or five abdominal segments bear large gills which seem to be absent on the next abdominal segments of the smaller specimens. The outer paleae are denticulate and gradually decrease in size but resolve at the tip into a few smooth spines. The inner paleae are like those of the typical form, but the middle paleae are either short and broad or elongated, toothed and erect, or alternating

as in *S. spinulosa*, var. *alcocki*. The outer paleae are of a type intermediate between those of *S. cementarium* Moore and the typical *S. pectinata* Fauvel.

Occurrence: Matlah River, Gangetic Delta.

Genus PALLASIA Quatrefages.

Opercular stalks elongated, each bearing two concentric rows of paleae. Dorsal hooks. Grooved, frilled, elongated palps. Numerous filiform tentacles on the ventral side of the opercular stalks. Three or four biramous parathoracic segments with oar-shaped setae. Dorsal filiform gills. Broad dorsal abdominal pinnules with pectinate uncini; ventral capillary setae. Tail smooth, achaetous. Thick tube of firmly cemented sand grains.

Key to the subgenera of Pallasia.

Three parathoracic segments. Outer paleae bent and denticulate, inner paleae smooth and slender	*Pallasia* Quatrefages s. str. p. 398.
Four parathoracic segments. Outer paleae smooth	*Lygdamis* Kinberg, p. 398.

Subgenus PALLASIA s. str. Quatrefages.

384. **Pallasia (Pallasia) pennata** Peters. (Fig. 208, *c–f*).

Pallasia pennata, Willey, 1905, p. 296, pl. VII, figs. 1–2: Augener, 1914, p. 79: Fauvel, 1917, p. 262 (Synonymy); 1931, p. 25, pl. III, figs. 7–10; 1932, p. 212.
Sabellaria bicornis Schmarda, Michaelsen, 1892, p. 19.
Idanthyrsus pennatus, Johansson, 1927, p. 88.

Outer paleae curved, strongly serrated. Inner paleae acuminate, smooth and more slender. One to three pairs of stout dorsal hooks. Three parathoracic segments bearing narrow oar-shaped setae with laciniate tip.

Length: 70 mm. by 6 mm.

Occurrence: Nankauri, Nicobar Islands; Andaman Islands; Ceylon; Manora Shoal, Karachi.

Distribution: Pacific, Indian and Atlantic Oceans, tropical area.

Subgenus LYGDAMIS Kinberg.

Key to the species of Lygdamis.

Outer paleae tapering	*indicus* Kinberg, p. 399.
Outer paleae lanceolate	*porrectus* Ehlers, p. 400.

Fig. 208.—*Pallasia* (*Lygdamis*) *porrectus* (Ehlers): *a*, anterior part, dorsal view ×4; *b*, paleae ×39 (after Ehlers). *P.* (*Pallasia*) *pennata* Peters: *c*, dorsal hook ×21; *d*, inner palea ×21; *e*, outer palea ×21; *f*, oar-shaped bristle ×32.

385. Pallasia (Lygdamis) indicus Kinberg. (Fig. 209, *a—k*).

Lygdamis indicus, Kinberg, 1867, p. 350: Johansson, 1926, p. 8, fig. 2: Fauvel, 1932, p. 212.

Sabellaria laevispinis, Grube, 1877, p. 542.

Tetreres laevispinis, Caullery, 1913, p. 200.

Pallasia laevispinis, Augener, 1927, p. 242.

(?) *Pallasia murata*, Allen, 1904, p. 299, pl. X: Fauvel, 1927a, p. 214, fig. 75, *a—k*.

(?) *Lygdamis muratus*, Johansson, 1927, p. 83.

Outer paleae straight, smooth, tapering; inner paleae shorter and stouter. One pair of stout dorsal hooks. A median tentacle between the opercular stalks. Large, elongated, grooved and frilled palps. Four parathoracic segments bearing narrow oar-shaped setae.

Length: 30—45 mm. by 5 mm.

Occurrence: Andaman Islands.

Distribution: Upolu Is., Samoa, Banka Strait; Andaman Islands; Cape of Good Hope; Atlantic Ocean, Ascension Island, English Channel (?).

Remarks: *Pallasia murata* Allen, from Plymouth, is very likely synonymous.

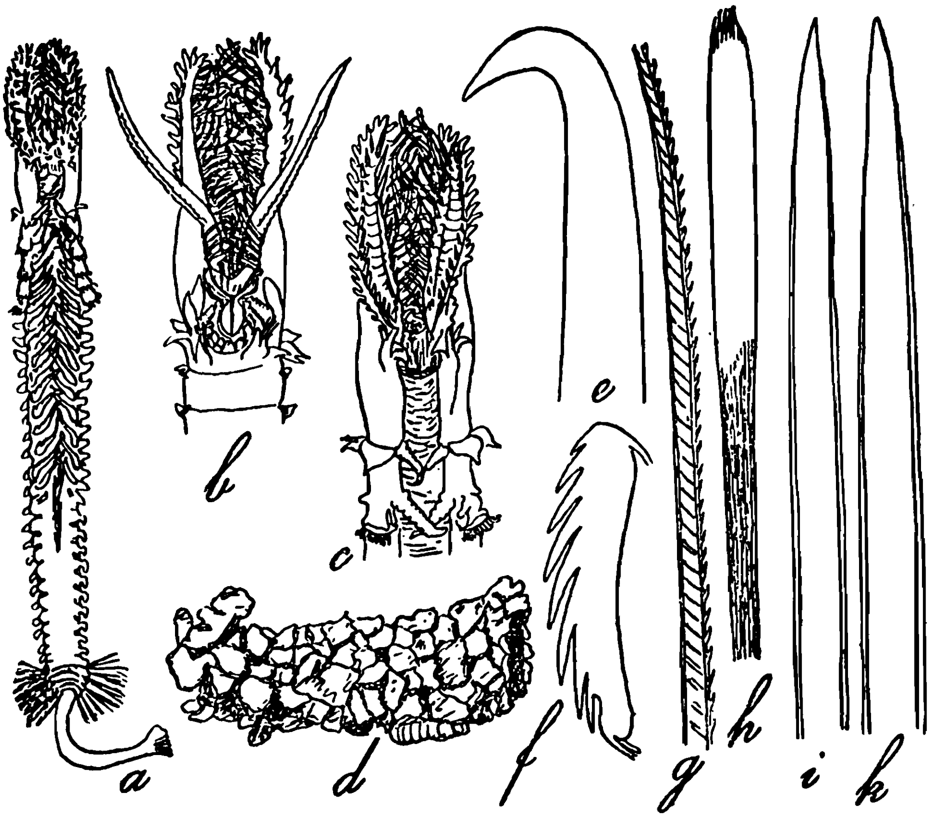

Fig. 209.—*Pallasia* (*Lygdamis*) *murata* Allen: (*a, d,* after Allen); *a,* dorsal view, reduced; *b,* anterior part, ventral view ×35; *c,* dorsal view ×35; *d,* part of a tube, natural size; *e,* interpeduncular hook; *f,* posterior uncinus; *g,* part of a ventral capillary bristle; *h,* parathoracic oar-shaped bristle; *i,* tip of an outer palea; *k,* tip of an inner palea (after McIntosh). (A species very likely conspecific with *P. indica* Kinberg).

386. **Pallasia (Lygdamis) porrectus** Ehlers. (Fig. 208, *a—b*).

Pallasia porrecta, Ehlers, 1908, p. 136, pl. XVIII, figs. 11—15, pl. XIX, fig. 1—3.
Lygdamis porrectus, Johansson, 1927, p. 86.
(?) *Pallasia chrysocephala,* Quatrefages, 1865, p. 322.

Outer paleae smooth, flat, lanceolate, pointed; inner paleae needle-shaped. One pair of brown dorsal hooks. Four thoracic segments bearing narrow, oar-shaped, setae with laciniate tips. Tube straight, thick-walled, coated with Foraminifera.

Length: More than 25 mm. by 4.5 mm.

Colour: yellowish white, with brown streaks on the ventral part.

Occurrence: From West Sumatra, 1280 m. Volcanic ooze.

Family **STERNASPIDIDAE** Malmgren.

Body very short and plump. Prostomium small, without appendages. First three segments armed, each with an incomplete belt of bristles. A pair of sexual papillae on the 7th setigerous segment, next eight segments achaetous. A ventral posterior shield with radiating bristles. A bundle of anal gills.

Genus **STERNASPIS** Otto.

Body swollen at both ends, segments short and few. Mouth subterminal. Anterior bristles short and stout. Horny shield composed of two trapezoid plates with radiating bundles of capillary setae. Filiform gills set on two posterior plates. Anus terminal.

387. Sternaspis scutata (Ranzani) (Fig. 210, *a–g*)

Sternaspis scutata, Moore, 1903, p. 487: Augener, 1926, p. 283: Fauvel, 1927a, p. 216, fig. 76, *a–g* (Synonymy); 1932, p. 213; 1933, p. 52.

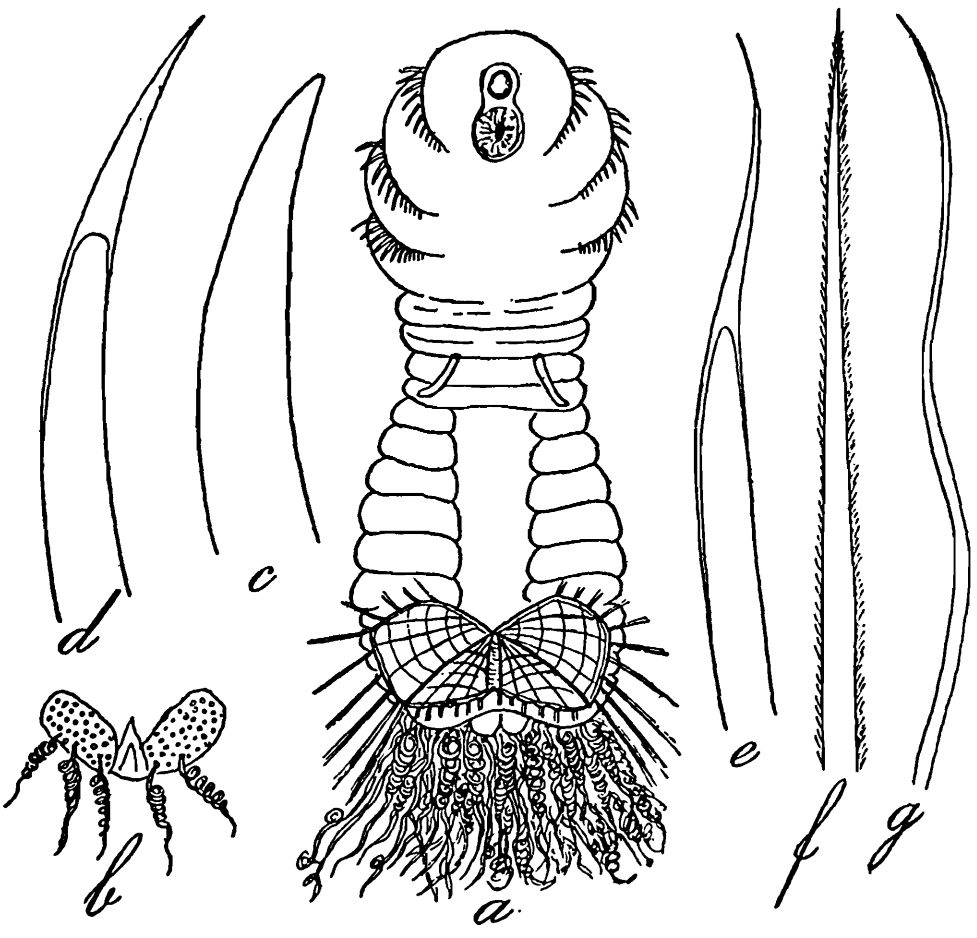

Fig. 210.—*Sternaspis scutata* (Ranzani): *a*, ventral view ×4; *b*, branchial plates ×4; *c*, a worn anterior bristle ×52; *d*, *e*, anterior bristles with transparent tip ×52; *f*, tip of a posterior barbed bristle ×130; *g*, posterior smooth capillary bristle ×130.

Sternaspis fossor, Stimpson, 1853, p. 29, pl. II, fig. 19.
Sternaspis costata, Marenzeller, 1879, p. 142, pl. VI, fig. 4: Southern, 1921, p. 649, pl. XX, fig. 5A, 5B.

Body sausage-like, narrowed in the middle, expanding at both ends. The anterior segments often retracted into the following ones. Densely coated with small filiform papillae. Prostomium reduced to a mere small knob. Shield plate divided into two unequal parts by a slanting line and marked with ridges and striae.

Length: 10—30 mm. by 8—10 mm.

Colour: greyish. Shields purple, violet or red or dark. Gills red.

Occurrence: Burma, Mergui; Andaman Islands; Chilka Lake, plentiful in mud; Ganjam Coast, Madras.

Distribution: Pacific Ocean, Japan, Petchili, New Zealand, Australia; Indian Ocean; Atlantic Ocean, Mediterranean Sea; Arctic Seas.

Remarks: Having had the opportunity to compare specimens of *Sternaspis* from the gulf of Petchili with those of India, Indo-China and Europe, I have failed to find any constant differences between *St. costata* Marenzeller and *St. scutata* Ranzani. The so-called accessory plates of Marenzeller are only the anterior border of the shield plates seen under the more or less transparent skin.

Family AMPHICTENIDAE Malmgren.

Segments few, body short, conical, divided into three regions: (1) thoracic, (2) abdominal with biramous segments, and (3) caudal (scapha), very small and leaf-like, with hooks at the base. An operculum of an anterior row of large golden setae (paleae). Two pairs of anterior foliated branchiae. A free, slightly conical tube of sand grains.

Key to the genera of AMPHICTENIDAE

Antennal veil fringed. A distinct stricture between abdomen and scapha	*Pectinaria* Lamarck, p. 402.
Antennal veil smooth. Stricture between abdomen and scapha less distinct	*Petta* Malmgren.

Genus PECTINARIA Lamarck.

Antennal veil fringed. Dorsal cephalic rim smooth or serrate. Uncini from the 4th setigerous segment.

Dorsal setae of two kinds: (1) with slender smooth tips, and (2) with serrated tips. Uncini pectinate, with numerous, and often unequal, teeth. Tube free, thin walled, straight or curved.

Key to the subgenera of Pectinaria.

1. Dorsal cephalic rim serrate	*Amphictene* Savigny, p. 403.
Dorsal cephalic rim smooth	2
2. 15 setigerous segments, 12 uncinigerous	*Lagis* Malmgren, p. 405.
17 setigerous segments, 13 uncinigerous	*Pectinaria* s. str. Lamarck, p. 403.

Subgenus PECTINARIA Lamarck.

388. Pectinaria (Pectinaria) antipoda Schmarda. (Fig. 211, *e–g*)

Pectinaria antipoda, Schmarda, 1861, p. 46, pl. XXIV, fig. 199: Nilson, 1928, p. 69, fig. 2: Pruvot, 1930, p. 78, pl. III, figs. 93–95: Fauvel, 1932, p. 214.
Cistenides antipoda, Augener, 1927, p. 231, fig. 13.

17 setigerous segments and 13 uncinigerous. Achaetous ante-scaphal segments absent but the 17th segment has only capillary setae. Dorsal rim of cephalic plate smooth. Antennal veil fringed and funnel shaped above the buccal tentacles. Dorsal setae narrow winged, with a straight smooth tip, or a geniculate spinulous tip. Uncini with 6–7 large decreasing teeth and 2–3 very small ones above the basal gouge-like process. Scapha ovate, with indented edges. Ligule very faintly bilobed, with a very small anal cirrus.

Length: about 40 mm. by 12 mm.

Occurrence: Koweit Harbour, Persian Gulf: 31 fms.

Distribution: Australia; New Caledonia; Persian Gulf.

Subgenus AMPHICTENE Savigny.

389. Pectinaria (Amphictene) crassa Grube. (Fig. 211 *a–d*).

Pectinaria crassa, Grube, 1870, p. 321: Nilsson, 1928, p. 58, fig. 18: Pruvot, 1930, p. 80, pl. III, fig. 89–92: Fauvel, 1932, p. 215.
Amphictene crassa, Augener, 1926, p. 463, fig. 9.

17 setigerous and 13 uncinigerous segments. Achaetous ante-scaphal segments absent. *Dorsal rim of the cephalic plate serrated.* Antennal veil fringed and funnel-shaped above the buccal tentacles. Dorsal setae winged, with a straight smooth tip, or a geniculate spinulous tip.

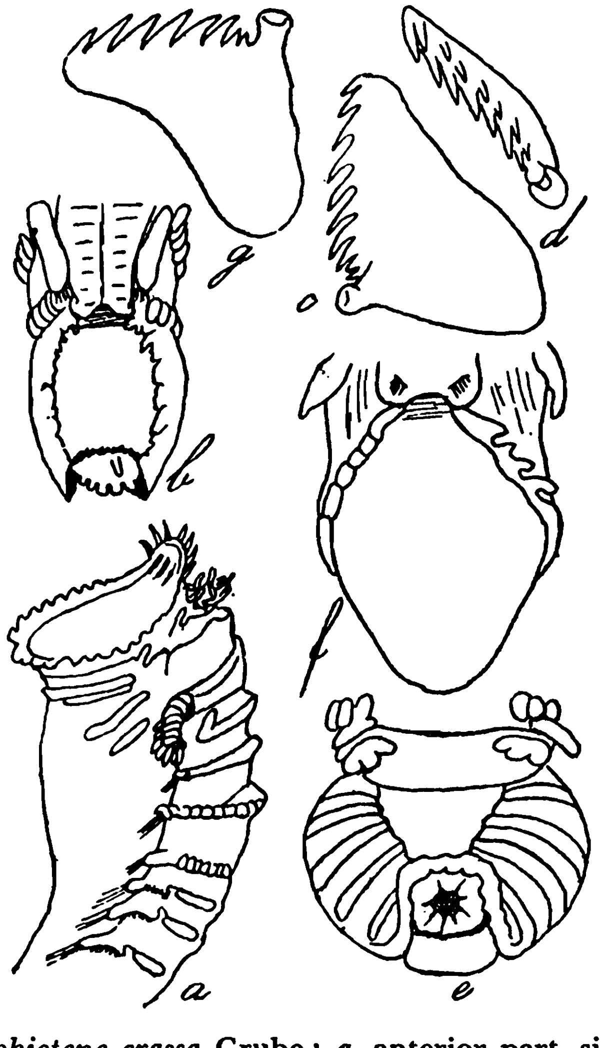

Fig. 211.—*Amphictene crassa* Grube: *a,* anterior part, side view ×1.5; *b,* scapha, dorsal view ×2.5; *c, d,* hook, side and front view ×365. *Pectinaria antipoda* Schmarda; *e,* scapha, ventral view enlarged; *f,* scapha, dorsal view, enlarged; *g,* hook ×350 (after Pruvot).

Uncini with two parallel rows each of 6—7 large decreasing teeth and 2—3 very small ones above the basal gouge-like process. Scapha longer than broad, with denticulate edges and small cirriform processes. Semi-circular ligule.

Length: 60 mm. by 15 mm.

Occurrence: Cochin backwater, near Ernakulam; Trincomalee.

Distribution: New Caledonia, Philippine Islands; Andaman Islands, Ceylon, Arabian Sea.

Subgenus LAGIS Malmgren.

390. **Pectinaria (Lagis) abranchiata** Fauvel. (Fig. 212, *a—e*).

Pectinaria (*Lagis*) *abranchiata*, Fauvel, 1932, p. 215, pl. VIII, figs. 10—14.

16 setigerous segments with capillary setae, 12 uncinigerous (from the 4th segment to the 15th) An achaetous segment in front of the scapha. Antennal veil fringed with 15—20 claviform papillae; it is funnel-shaped above

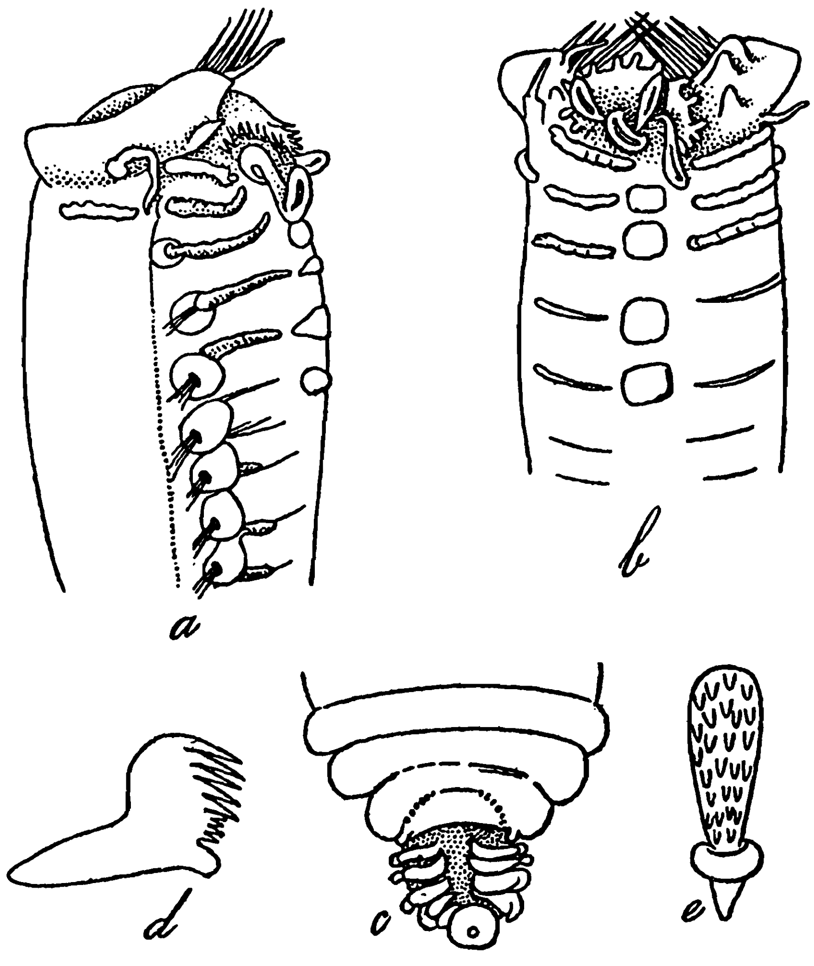

Fig. 212.—*Pectinaria* (*Lagis*) *abranchiata* Fauvel: *a*, anterior end, side view ×10; *b*, anterior end, ventral view ×10; *c*, scapha ×14; *d*, uncinus ×1200; *e*, uncinus, front view ×1200 (from Fauvel 1932).

the buccal tentacular cirri and is not bound to the first setigerous segment. Dorsal rim of the cephalic plate smooth. On each side, about 15 stout golden paleae with a very slender rolled-in tip; the inner paleae are shorter and more slender than the others. Two narrow dorsal elongated pads at the back of the third segment. Thoracic ventral shields with transverse glandular pads from the

2nd segment to the 5th, followed by a rounded median patch to the 6th (2nd uncinigerous) *Branchiae absent.* Glandular triangular lobes of the 4th segment absent. Ventral body walls thin and transparent. Dorsal capillary setae narrow winged; some are long, straight, stiff, with a slender, very faintly spinous tip, while others have bent finely serrated tips. Uncini pectinate, with several ventral rows of numerous teeth above the large gouge-like lower process. The hooks at the base of the scapha, about 10—12, are short, stout and set in a curved row on either side. Scapha short and stout, with erect edges bearing short ovate knobs. Anal ligule triangular, with a smooth edge and a very small cirrus. Tube straight (?), very brittle, made of a single layer of transparent quartz grains held together by a yellowish cement.

Length: 11—17 mm. by 3 mm.

Colour: Whitish yellow, in spirit, with golden paleae.

Occurrence: Cochin backwater, near Ernakulam.

Incertae sedis

391. **Pectinaria panava,** Willey, 1905, p. 295, pl. V, fig. 137.

The characters given are not even sufficient for a generic identification. Ceylon.

392. **Pectinaria** capensis Gmelin, Quatrefages, 1865, p. 334.

"Seas of India and Cape of Good Hope."

Family **AMPHARETIDAE** Malmgren.

Body divided into two regions: (1) thorax with dorsal capillary setae and ventral uncinigerous pinnules, and (2) abdomen bearing only uncinigerous pinnules. Prostomium conical or trilobed. Buccal tentacles long, smooth or pinnate, *retractile into the mouth.* Three or four pairs of subulate, seldom pinnate, gills inserted on the anterior segments and having in front two bundles of paleae, sometimes absent.

Key to the genera of AMPHARETIDAE.

1. Pinnate gills	*Schistocomus* Chamberlin, p. 411.
Subulate gills	2
2. Segments numerous, 50 or more	4
Segments few, 20 to 40	3

3. Paleae present. Tentacles smooth	*Amphicteis* Grube, p. 407.
Paleae absent. Tentacles smooth	*Amage* Malmgren, p. 410.
4. A large, curved hook on each side, behind the gills	*Melinna* Malmgren, p. 413.
Large hooks behind the gills absent	*Melinopsis* McIntosh, p. 412.

Genus AMPHICTEIS Grube.

Prostomium with a median groove and two ridges. Buccal tentacles smooth. Four pairs of gills. 17 bristled segments. Uncinigerous pinnules commencing on the 4th setigerous segment. Uncini uniserial, subtriangular, with few teeth. Anal segment with two cirri.

Key to the species of Amphicteis.

A close set group of 4 gills on either side of the first and second setigerous segments	*gunneri* Sars, p. 407.
Four pairs of gills set further back on the third segment	*posterobranchiata* Fauvel, p. 408.

393. Amphicteis gunneri Sars. (Fig. 213 *a–k*)

Amphicteis gunneri, Malmgren, 1865, p. 365, pl. XIX, fig. 46: Fauvel; 1897, p. 411, pl. XXV, figs. 150–161; 1932, p. 216: Hessle, 1917, p. 116.

Amphicteis japonica, McIntosh, 1885, p. 431, pl. XXVIIA, figs. 3–5.

17 thoracic setigerous and 15 abdominal uncinigerous segments. Numerous eye-spots. Golden paleae straight or curved at the tips, which are more or less tapering. Gills inserted on the first and second segments in two close-set groups of four each. Feet with a clavate papilla at the ventral edge distally. Abdominal pinnules with a dorsal short process; the dorsal cirri replace the absent dorsal ramus. Uncini with a single row of 4–7 teeth. Tube membranous, coated with mud.

Length: 20–40 mm. by 3–5 mm.

Colour: in life, pink or yellowish with white dots and brown spots.

Occurrence: Andaman Islands, 290 fms.: off Akyab, Burma; Orissa Coast; Gulf of Oman, 609 fms.

Distribution: Japan, Indochina; Bay of Bengal, Gulf of Oman; Atlantic Ocean, Mediterranean Sea; Antarctic Ocean.

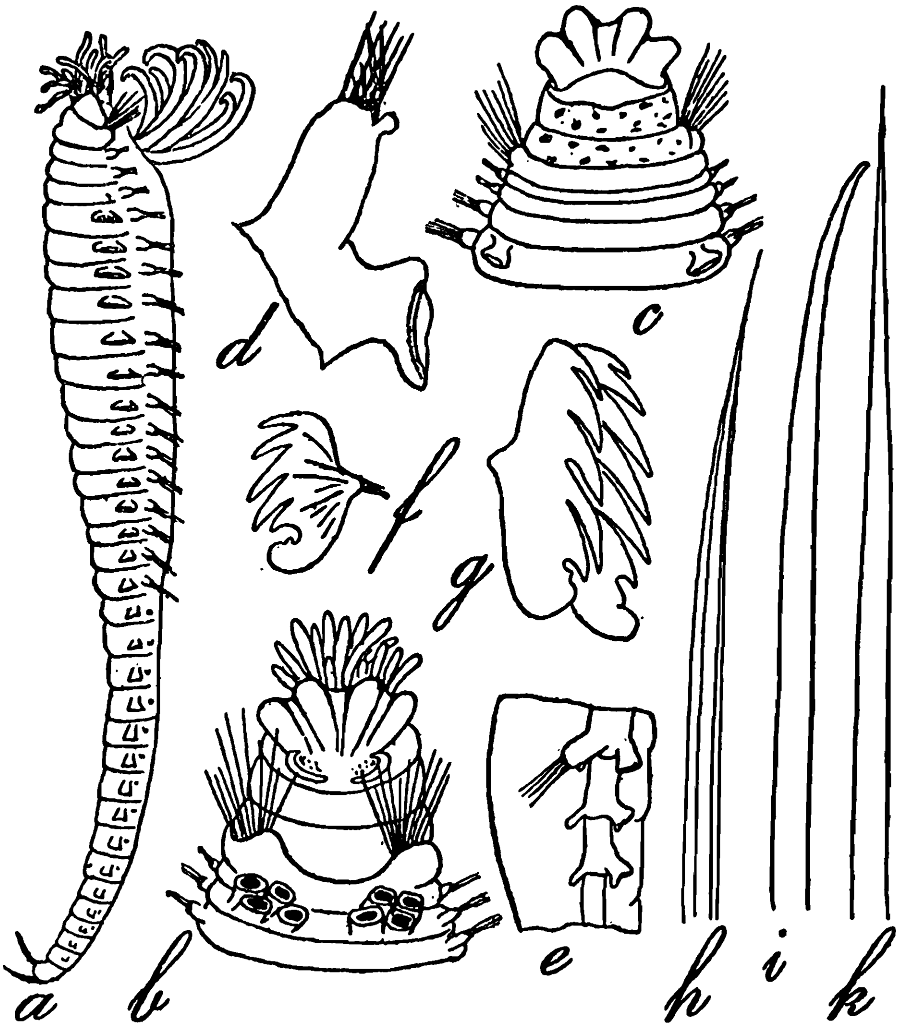

Fig. 213.—*Amphicteis gunneri* Sars: *a*, side veiw ×2.5; *b, c*, anterior part, dorsal and ventral view, gills cut off ×6; *d*, thoracic foot with cirrus and pinnules ×12; *e*, last thoracic segment and first abdominal pinnules ×2.5; *f*, uncinus ×240; *g*, five and six-toothed uncini from the same foot ×400; *h*, capillary winged bristle ×120; *i, k*, smooth and sharp paleae ×15.

394. **Amphicteis posterobranchiata** Fauvel. (Fig. 214, *a—e*).

Amphicteis posterobranchiata, Fauvel, 1932, p. 217, pl. IX, figs. 7—11.

17 thoracic setigerous segments with dorsal capillary setae; 13 abdominal segments with uncinigerous pinnules. Prostomium lobed, with a median groove and two diverging glandular ridges. Edge of the nuchal organs raised into a curved pad. Buccal segment as long as the three succeeding segments. Golden-yellow paleae ending in a very slender straight or curved tip, about 20—25 on either side. Eight large subulate gills, the first six disposed in two crowded groups of three, on the first setigerous segment, separated in the middle of the dorsal surface by a

raised rectangular cushion. *The fourth pair is set far back from the first three* on the third setigerous segment. Uncinigerous pinnules commence on the 4th setigerous segment. Dorsal ramus cylindrical, with a small club-shaped cirrus on the last thoracic segments. Capillary setae winged and smooth. Uncinigerous pinnules shaped as a flattened knob, pedunculate and bearing a single

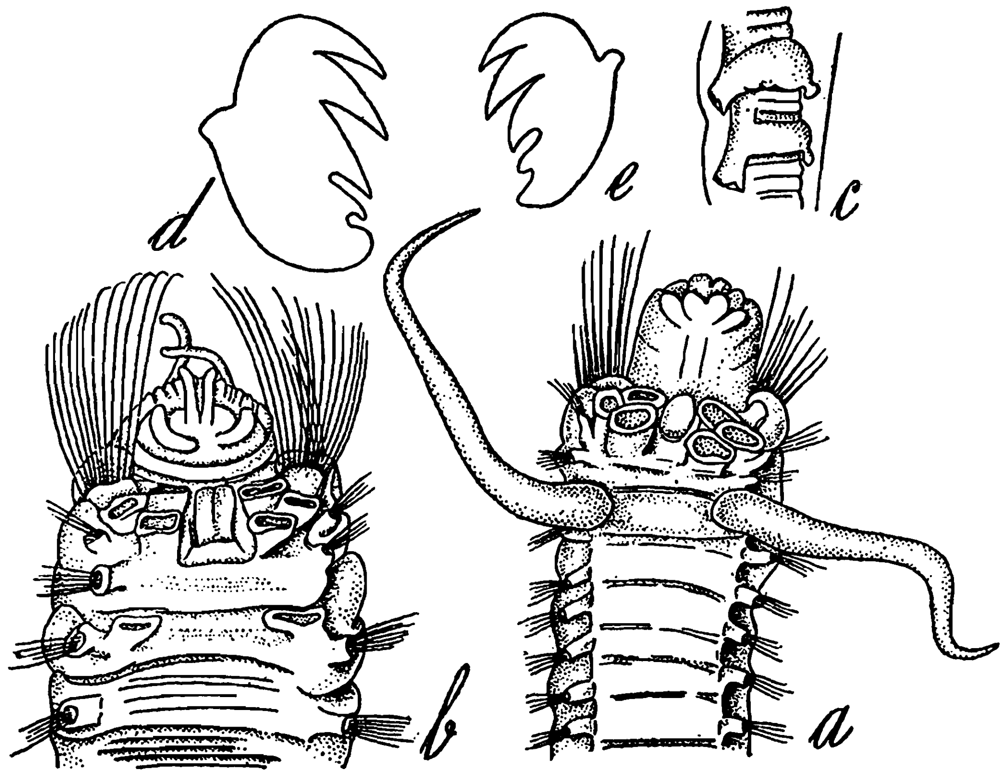

Fig. 214.—*Amphicteis posterobranchiata* Fauvel: *a,* dorsal view of anterior end ×5; *b,* dorsal view of anterior end of another specimen ×5; *c,* abdominal pinnules ×8; *d,* thoracic uncinus ×333; *e,* abdominal uncinus ×333 (from Fauvel).

retrogressive row of *pectiniform uncini with three large bent teeth.* The manubrium has a dorsal spine on which a "soie-tendon" is inserted. In the abdomen, the pinnules are flattened, sub-rectangular, with a very short, dorsal, blunt process. The dorsal cirri, reduced to a pedunculate small knob, persist in place of the setigerous lobes. Two anal cirri. Tube membranaceous coated with mud.

Length: up to 42 mm. by 5 mm.

Colourless, in spirit.

Occurrence: Bay of Bengal, 606—678 fms.; off Ceylon, 660 fms.; off Cape Comorin, 670 fms.; Arabian Sea, 544 fms.

Genus AMAGE Malmgren.

Body rather short. Bristled thoracic segments 14 to 17 in number. Uncinigerous pinnules commencing on the 4th setigerous segment. Uncini subtriangular, pectiniform. Prostomium with two ridges. Buccal tentacles smooth. Three or four pairs of gills. Anal segment with two cirri. *Paleae absent.*

395. **Amage bioculata** (Moore) (Fig. 215, *d, e*).

Samytha bioculata, Moore, 1906, p. 253, pl. XII, fig. 52, 53; 1908, p. 350: Hessle, 1917, p. 122.
Amage bioculata, Fauvel, 1932, p. 218.

17 thoracic setigerous segments. 13—14 abdominal uncinigerous segments. Prostomium quadrate, broader than long. Numerous eye-spots. *Paleae absent.* Four pairs of much crowded, slightly flattened, slender and

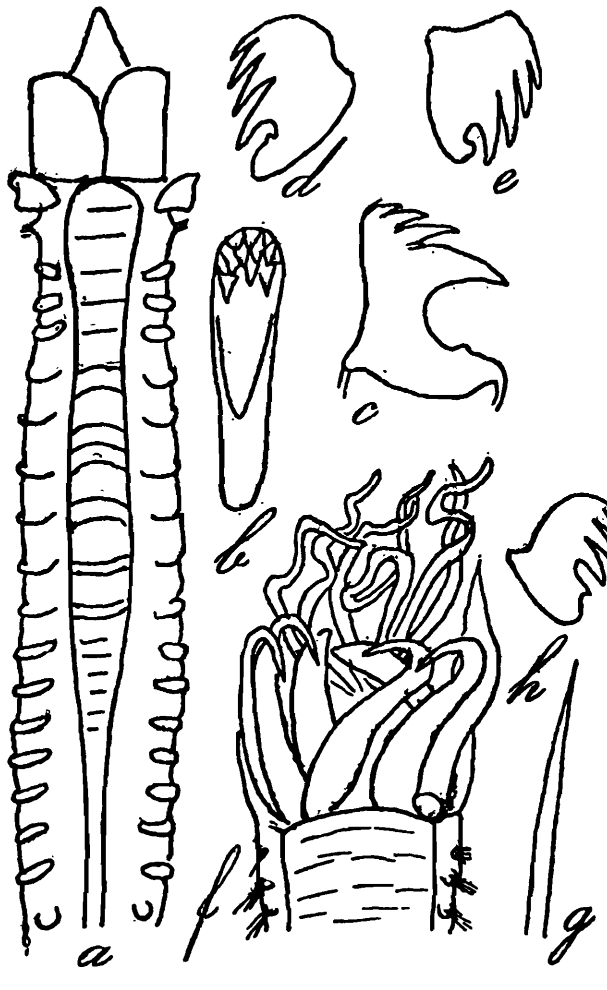

Fig. 215.—*Lanice socialis* (Willey): *a*, anterior part, ventral view tentacles omitted; *b, c*, hooks, front and side view (after Willey). *Amage bioculata* (Moore): *d, e*, hooks ×600 (after Moore). *Melinopsis dubita* (Hoagland): *f*, anterior part, dorsal view ×5; *g*, seta from the 2nd segment ×350; *h*, hook ×350 (after Hoagland).

elongated gills. First foot with a very small tuft of setae. In the abdomen dorsal ramus reduced to a small achaetous papilla, projecting from the dorsal angles of the body. Uncinigerous pinnules are compressed lappets, constricted at the base, apparently lacking cirri. Uncini roughly triangular, bearing 4–5 long, slender, acute, overlapping teeth.

Length: 9 mm.

Occurrence: Off Puri, Orissa, Bay of Bengal; 13 fms.

Distribution: North Pacific Ocean, Gulf of Georgia; India.

Genus SCHISTOCOMUS Chamberlin.

"Like *Phyllocomus* in lacking tentacles and post-branchial spines, in bearing fifteen pairs of fasciae of capillary setae and four pairs of branchiae. It differs from that genus in having the branchiae of two types, one pair being of the ordinary, smooth, simple, subulate form and the other three with the edges divided, two pinnately, bearing two close series of lamellar branches, and one with an essentially single series of branches in the genotype." (Chamberlin).

396. **Schistocomus hiltoni** Chamberlin. (Fig. 216, *a–e*).

Schistocomus hiltoni, Chamberlin, 1919, p. 17: Fauvel, 1932, p. 219, pl. VIII, figs. 15–19.

Body swollen and somewhat abruptly truncate in front, tapering backwards to a slender tail. 15 thoracic setigerous segments; about 32 abdominal uncinigerous segments. Prostomium projecting forwards as a single hood with rounded anterior corners, devoid of ridges and eyes. Buccal segment broad and short, concave dorsally, ventrally with a lower lip closing the mouth. Buccal tentacles absent (?). *Paleae and post-branchial hooks absent.* Four pairs of branchiae of two types. On the first setigerous segment, a pair of outer subulate gills and two inner pinnate gills attached near the middle of the dorsum. On the 2nd and 3rd setigerous segments a broad pinnate gill on each side. On the 5th setigerous segment a transverse, slender, whitish ridge, faintly raised. Uncinigerous pinnules from the 4th setigerous segment; in the thoracic region they bear a small papilla at their upper border; in the abdomen this process becomes cirriform and the dorsal ramus is reduced to a flattened blunt achaetous lobe and a small rounded papilla. The ovate pygidium bears a crown of short cirri. Dorsal capillary setae

winged. Uncini sub-rhomboidal with 6 large curved teeth set in a single vertical row.

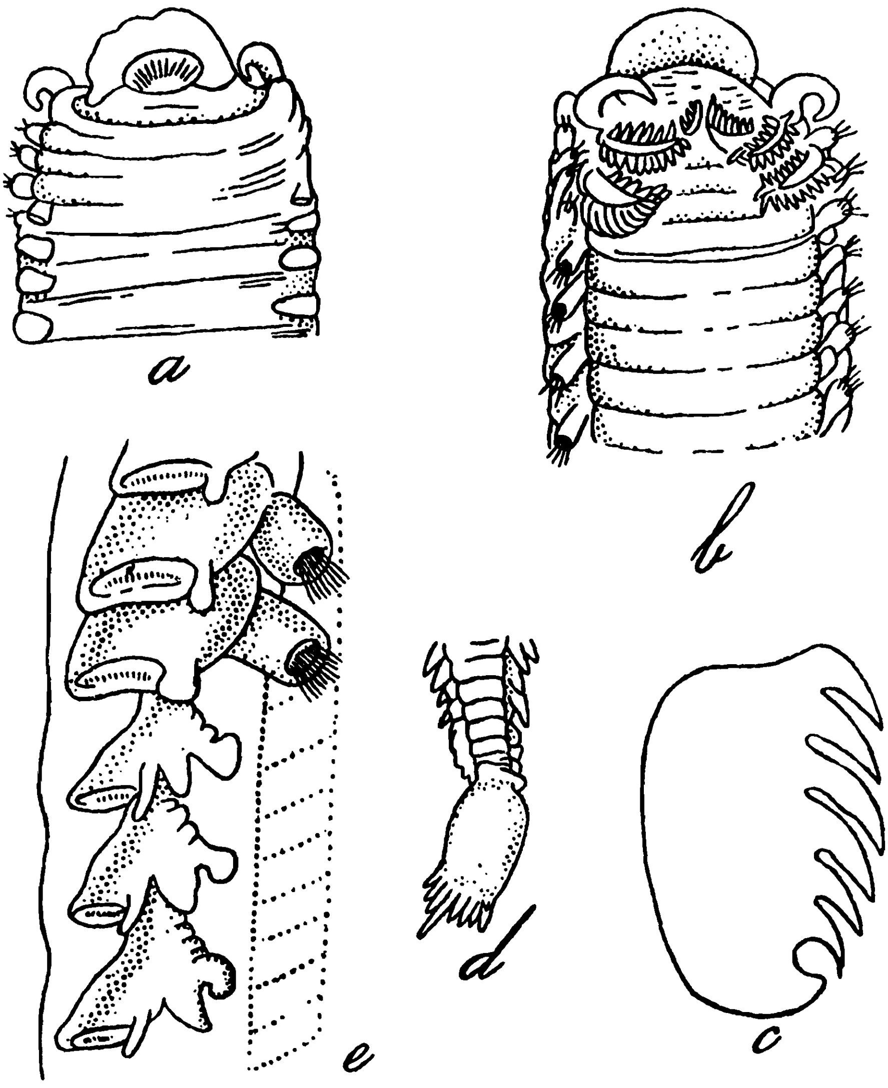

Fig. 216.—*Schistocomus hiltoni* Chamberlin: *a,* anterior end, ventral view ×8; *b,* anterior end, dorsal view ×8; *c,* thoracic uncinus ×500; *d,* pygidium ×12; *e,* last thoracic and first abdominal pinnules ×12 (from Fauvel 1932).

Length: 24 mm. by 4 mm.

Colour: light yellow, with brown spots.

Occurrence: Madras Coast; 5—10 fms.

Distribution: Laguna Bay, California; Madras Coast.

Genus **MELINOPSIS** McIntosh.

Differs from *Melinna* in the absence of hooks behind the gills and the presence of a dorsal membranous collar.

397. **Melinopsis dubita** (Hoagland). (Fig. 215, *f*—*h*).

Melinna dubita, Hoagland, 1920, p. 624, pl. I, figs. 13—16.
Melinopsis dubita, Fauvel, 1932, p. 220.

Prostomium ending in a folded upper lip. Buccal segment largely covered by the following one; next four segments forming a collar-like structure with a prominently developed lateral region, extending obliquely from ventral to dorsal surface. First two segments marked by a row of fine setae. Third segment with similar setae ventrally and a delicate tuft of similar, but larger, capillary setae dorsally. Fourth segment with a small prominent tuft of dorsal setae, but without any ventral setae. The succeeding 13 thoracic segments with a conspicuous dorsal, cylindrical, setigerous lobe, bearing winged capillary setae. Uncinigerous pinnules from the 5th setigerous segment. Abdomen with numerous segments bearing only square uncinigerous pinnules without any process. A small dorsal globular knob. Uncini pectinate, with four large teeth above the ligament process. Buccal tentacles of two kinds: (1) long, slender, and (2) short, thick, smooth, grooved. Four pairs of gills, stout, tapering, broad and flattened. Tube composed of a tough inner membrane and a very thick outer coating of fine mud, 140 mm. long by 8—10 mm. and a bore of only 2—3 mm.

Occurrence: Bay of Bengal 300 fms.; Laccadive Sea, 430 fms.

Distribution: Mindanao, Philippine Islands; Bay of Bengal, Laccadive Sea.

Genus MELINNA Malmgren.

Body long, slender, tapering behind; segments numerous, 50 and more. Prostomium without glandular ridges. Buccal tentacles smooth. Four pairs of long, subulate, fasciculate gills. *Paleae absent.* A pair of large hooked spines behind the gills. A dorsal transverse membrane on the 6th segment. Segments 2 to 6 coalesced in the form of a vagina partly ensheathing the mouth and the sides of the branchiae and bearing a ventral row of very fine setae. Uncinigerous pinnules from the 7th segment. Dorsal capillary setae winged. Uncini subtriangular, with a few teeth.

398. **Melinna aberrans** Fauvel. (Fig. 217, *a—f*)

Melinna aberrans, Fauvel, 1932, p. 221, pl. IX, figs. 21—26.

14 thoracic setigerous segments with dorsal capillary setae (first foot very small, rudimentary). At least 30 abdominal uncinigerous segments. Body slender, greatly tapering posteriorly. Prostomium broad, short, anterior border faintly lobed, without glandular ridges, and bear-

ing, on either side, a transverse row of many eye-spots. Buccal segment partly sheathed into the next, which forms a ventral collar deeply notched in the middle. Buccal tentacles stout, smooth and few. Eight elongated, subulate, ringed gills crowded into two groups and bound together by a membrane reaching up to a third of their length; in each group they are fasciculate at the base.

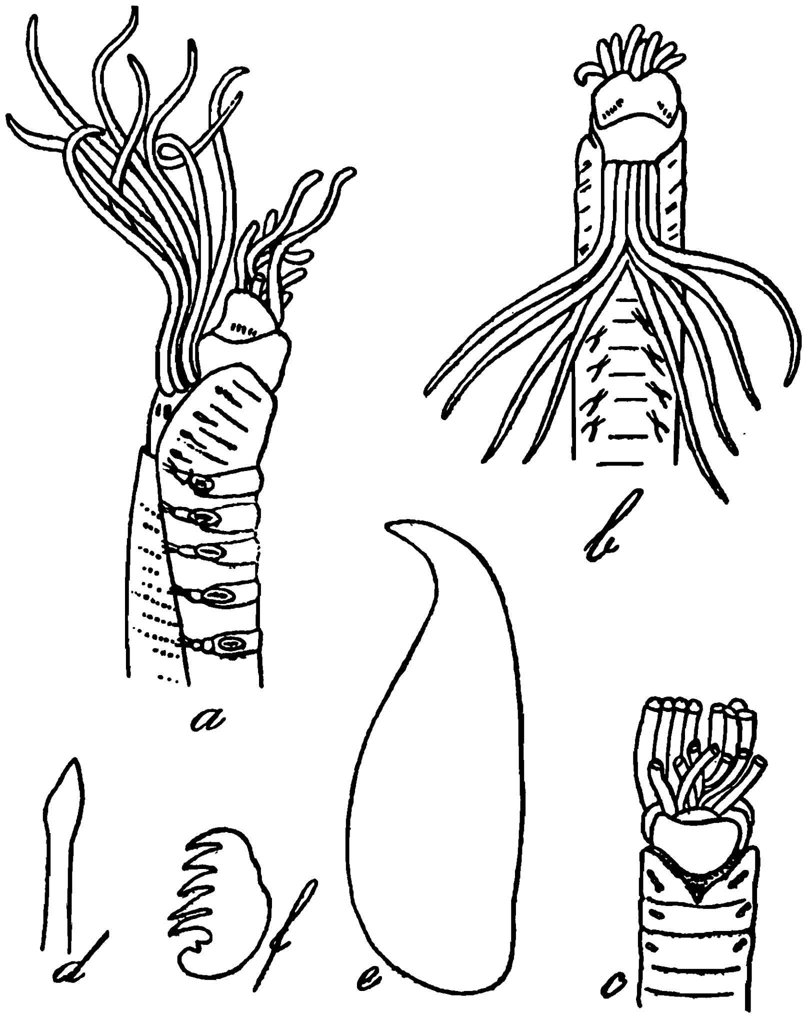

Fig. 217.—*Melinna aberrans* Fauvel: *a*, anterior end, side view ×12; *b*, anterior end, dorsal view ×12; *c*, anterior end, ventral view, tentacle and gills cut short ×12; *d*, small ventral seta from anterior segments ×500; *e*, postbranchial hook ×200; *f*, uncinus ×700 (from Fauvel 1932).

Segments 2 to 5 form a long groove, the lateral edges of which are raised up, and united behind the gills by a transverse membrane; the anterior margin of the membrane is convex and smooth. Segments 2, 3, and 5 bear a transverse row of very fine, sharp, wingless ventral setae. There is also a small bundle of dorsal capillary winged setae on the 5th segment. The 4th segment bears, on either side behind the gills, a large bent hook. On the 6th segment there is a small tuft of dorsal capillary wing-

ed setae, but ventral setae are absent. The next 12 segments bear dorsal capillary winged setae and uncinigerous tori. Uncini with a single row of 5 teeth. In the abdomen the uncinigerous pinnules are rectangular and devoid of cirriform processes. Tube membranous, cylindrical, coated with a thick layer of fine mud and sand.

Length: about 20 mm. by 1 mm.

Colourless, in spirit.

Occurrence: Vizagapatam Harbour and Channel connecting backwater with the sea.

Family TEREBELLIDAE Grube.

Body divided into thorax, with dorsal capillary setae and uncinigerous tori, and abdomen, generally devoid of dorsal setae but bearing uncinigerous pinnules. Prostomium bearing filiform grooved tentacles, not retractile into the mouth. Branchiae ramose, rarely filiform or subulate, 1 to 3 pairs (or none) inserted on segments 2, 3 and 4. Paleae absent. Dorsal capillary setae generally winged, with smooth or spinulose tip. Uncini avicular or pectiniform. Ventral glandular scutes or shields in the thorax. Membranaceous tube coated with sand.

Key to the genera of TEREBELLIDAE.

1. Uncini absent	*Lysilla* Malmgren, p. 435.
Thoracic and abdominal uncini of two kinds. A single pectinate gill	*Terebellides* Sars, p. 436.
Thoracic and abdominal uncini not of two kinds ..	2
2. Thoracic uncini all set in single rows	3
Thoracic uncini set in double rows ..	5
3. Filiform gills	4
Gills absent	*Polycirrus* Grube, p. 434.
4. Dorsal setae begin on 3rd segment	*Thelepus* Leuckart, p. 430.
Dorsal setae begin on 2nd segment	*Streblosoma* Sars, p. 432.
5. Dorsal setae serrated at the tip, often of two kinds. Gills ramose	*Terebella* Linnaeus, p. 420.
Dorsal setae with a smooth tip	6

6. Uncini of the first segments with a long chitinous process	*Pista* Malmgren, p. 422.
Uncini without a long chitinous process	7
7. Uncini set back to back	8
Uncini avicular, not back to back	9
8. Uncini pectiniform	*Loimia* Malmgren, p. 416.
Uncini avicular	*Lanice* Malmgren, p. 418.
9. Three pairs of gills. Well developed lateral lobes on the first segments	*Polymnia* Malmgren, p. 418.
Two pairs of gills. No lateral lobes on the first segments	*Nicolea* Malmgren, p. 420.

Subfamily *AMPHITRITINAE* Malmgren.

Branchiae bushy, rarely cirriform, or wanting. Dorsal setae smooth or serrated, thoracic uncini in double rows.

Genus LOIMIA Malmgren.

Seven thoracic bristled segments. Three pairs of arborescent gills. First segments with lateral lobes. Dorsal capillary setae winged, smooth at the tip. Uncini pectinate, *opposed back to back;* in double rows from the 7th to the 17th thoracic setigerous segments. Statocysts in the second segment.

399. **Loimia medusa** (Savigny) (Fig. 218, *a–f*).

Loimia medusa, Malmgren, 1865, p. 380, pl. XXV, fig. 80: Willey, 1905, p. 302, pl. VI, figs. 155—159: Fauvel, 1914a, p. 145, pl. VII, figs. 6—9; 1932, p. 224; 1935, p. 543: Augener, 1926, p. 465: Gravely, 1927, p. 25.

Loimia annulifilis Grube, Willey, 1905, p. 301, pl. VI, figs. 153, 154: Gravely, 1927, p. 25: Augener, 1927d, p. 142.

Loimia montagui Grube, Willey, 1905, p. 303, pl. VI, figs. 160—163.

Loimia crassifilis Grube, Willey, 1905, p. 302: Michaelsen, 1892, p. 20.

Loimia variegata Grube, Willey, 1905, p. 304: Augener, 1926, p. 466, fig. 10.

Thoracic region swollen; abdomen long and slender. A large rounded foliaceous arched lip over the mouth. Lateral lobes of the first segments large and foliaceous. 3 pairs of subequal gills with numerous, slender, branches. The uncini are flat pectinate plates with 4—5 long curved

teeth set in a single row. Capillary dorsal setae winged, with a smooth tip, on 17 thoracic segments. About 9–10 ventral shields. Tube membranous coated with sand and debris.

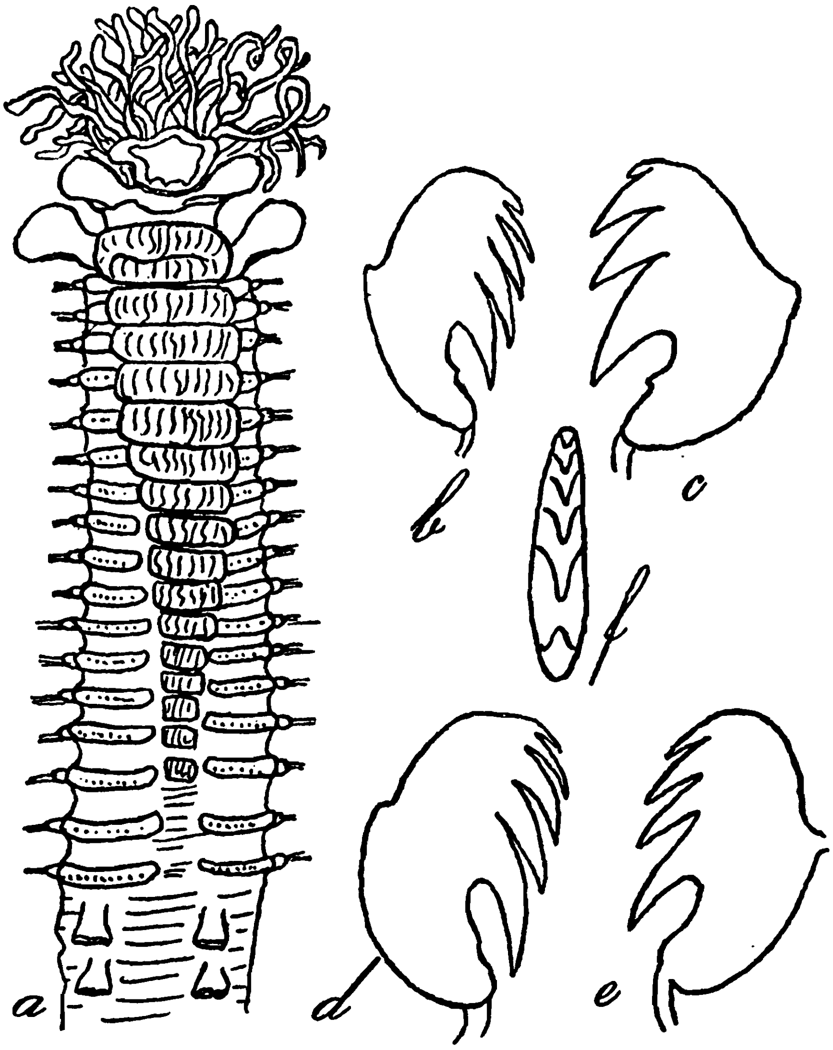

Fig. 218.—*Loimia medusa* (Savigny): *a*, ventral view ×3; *b*, abdominal hook ×440; *c*, *d*, thoracic hooks ×440; *e*, abdominal hook ×440; *f*, hook, front view ×440.

Remarks: *Loimia annulifilis* Grube is only a colour variety often met with, the tentacles of which are ringed, with purple bands. *L. crassifilis* Grube, *L. montagui* Grube, *L. variegata* Grube are only varieties. The number of teeth of the uncini is not characteristic for it varies with age, size and wear.

Length: 60–120 mm. by 6–10 mm.

Colour: in life variable, grey or yellowish with dark brown transverse thoracic bands and a dark streak under the tori. Ventral shields red.

Occurrence: Burma; Andaman Islands; Bay of Bengal; Ceylon; Gulf of Mannar.

Distribution: Pacific Ocean, California, Japan, Indo-china; Indian Ocean, Persian Gulf, Red Sea; Atlantic Ocean.

Genus LANICE Malmgren.

17 setigerous thoracic segments, 3 pairs of arborescent gills. Lateral lobes on the first segments. Ventral scutes more or less fused. Dorsal capillary setae winged, with a smooth tip. *Uncini avicular* with transverse rows of denticles on the vertex: they are *opposed back to back*, in double rows, on a number of thoracic tori. Tube coated with sand.

400. Lanice socialis (Willey). (Fig. 215, *a—c*).

Polymnia socialis, Willey, 1905, p. 299, pl. VI, figs. 146—148.

Dorsal surface smooth and convex. The first segment, which forms the lower lip, is long below and deeply cleft, the right half slightly overlapping the left. Lateral lobe of the 2nd segment is a semi-lunar, symmetrical, free dermal fold. The band of ventral scutes, rounded in front, attenuate behind, ends, as a white streak, in the region of the 13th—14th tori. Dorsal setae narrowly limbate, with a smooth tip. Thoracic uncini uniserial in the first six tori, biserial and *opposed back to back* in the rest, uniserial again in the abdominal pinnules. The uncini are avicular with a number of denticulations arranged in arcs across the vertex. Narrow, sand encrusted, tubes.

Length: 20 mm. by 2 mm.

Occurrence: Ceylon, Galle; 16—30 fms.

Remarks: This species is very closely allied to *L. conchilega* (Pallas) of Europe.

Genus POLYMNIA Malmgren.

Generally 17 thoracic setigerous segments. Eye-spots numerous. Three pairs of arborescent gills arising from a main stem. Lateral lobes in anterior segments. Well marked ventral scutes. Dorsal capillary setae smooth at the tip; they commence on the third gill-bearing segment. Uncini with an elongated base, a lateral spur and denticles above the main fang; they are set in biserial rows on a number of thoracic segments.

401. Polymnia nebulosa (Montagu) (Fig. 219, *a–g*)

Polymnia nebulosa, Fauvel, 1917, p. 267, figs. 28; 1927a, p. 257, fig. 89; 1930a, p. 55, 1932, p. 224.
Polymnia triplicata, Willey, 1905, p. 300, pl. VI, figs. 149–154.
Polymnia trigonostoma, Augener, 1914, p. 80.

Body plump, soft, very brittle. 17 thoracic segments. A raised cephalic ridge, with very numerous, small eye-spots. Upper lip well developed. Buccal segment collar shaped. Oval lateral lobes on segments 2–3. Ventral scutes wrinkled. Three pairs of gills with a sub-dichoto-

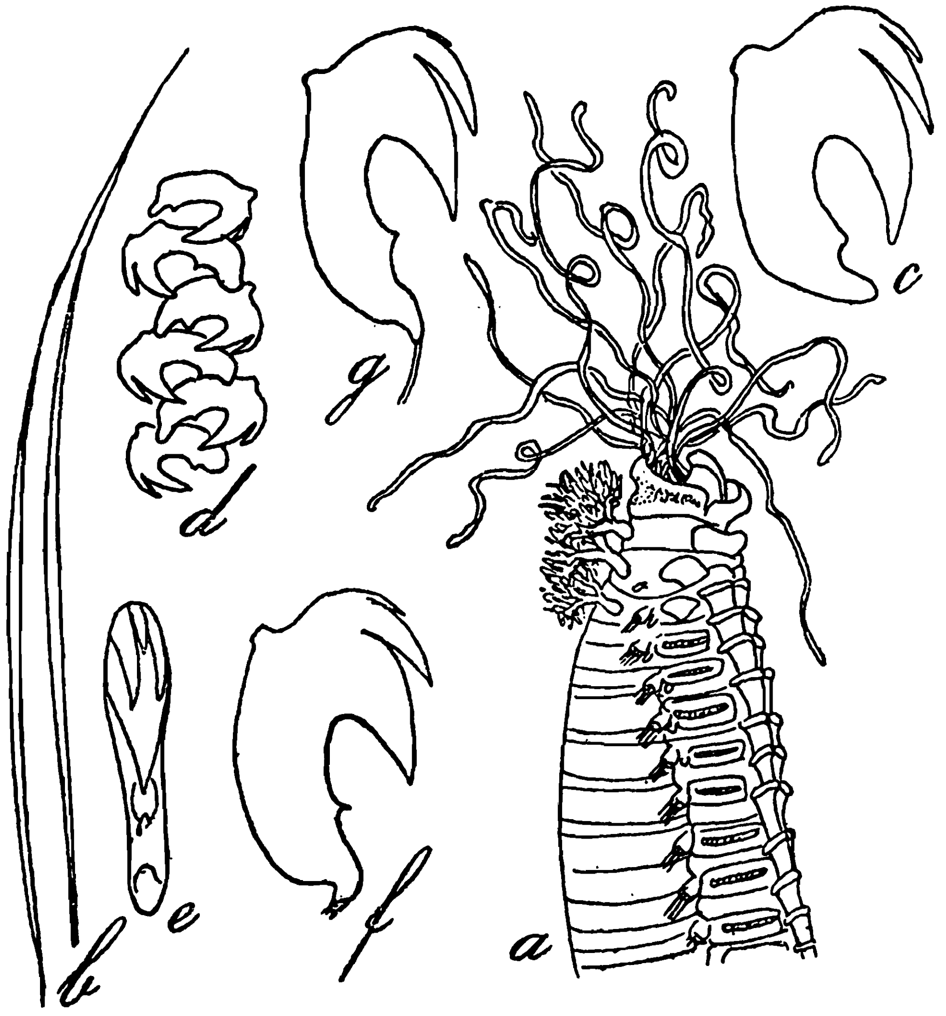

Fig. 219.—*Polymnia nebulosa* (Montagu): *a,* anterior part ×4; *b,* capillary bristle ×150; *c,* uncinus from the 2nd segment ×400; *d,* double row ×150; *e, f,* uncini from a double row, front and side view ×400; *g,* abdominal uncinus ×400.

mously divided large stem. Nephridial papillae from 3rd to 8th segment. Uncini with an elongated convex base, a process for a ligament, a main fang, two large teeth and 1–5 small denticles on the vertex. Tube of shell fragments and dèbris.

Length: 5–150 mm. by 3–8 mm.

Colour: in life orange grey, pink or brown, with small white dots. Uncoloured in spirit.

Occurrence: Gulf of Mannar, Pamban Island, Ceylon, Andaman Islands, Maldives, Nicobars.

Distribution: Pacific Ocean; Indian Ocean, Persian Gulf, Red Sea; Atlantic Ocean, Mediterranean Sea.

Genus NICOLEA Malmgren.

15—25 thoracic setigerous segments. Eyes present. Two pairs of ramose gills. The first segments do not show lateral lobes. Ventral scutes. Dorsal capillary setae smooth at the tip. Uncini from the 2nd setigerous segment; they are avicular with transverse rows of denticles on the vertex and are set in uniserial, alternate or semi-opposite, rows on a number of thoracic segments. Tube membranous, coated with sand.

402. **Nicolea gracilibranchis** (Grube). (Fig. 220, *d*).

Nicolea gracilibranchis, Marenzeller, 1884, p. 207, pl. II, fig. 2: Hessle, 1917, p. 173: Fauvel, 1930a, p. 56, 1932, p. 295.
Terebella gracilibranchis, Grube, 1878, p. 230; pl. XII, fig. 6.

Two pairs of gills. 17 thoracic setigerous segments with smooth capillary setae and very projecting abdominal pinnules, whose uncini are bidentate above the main fang. The eyes are hidden under the cephalic folds. The posterior lip is bilobed. The anterior segments have not lateral lobes. There are 14—15 ventral scutes. On the segment before the first setigerous lies a small papilla behind the second gill. Nephridial papillae are conspicuous on the 3rd and 4th setigerous segments.

Length: 70 mm.

Occurrence: Singapore; Madras Coast, Gulf of Mannar, Tuticorin, Pamban.

Distribution: Hawaii; Japan; Philippine Islands; India.

Genus TEREBELLA Linnaeus.

Dorsal capillary setae on a very large number of segments, commencing on the 4th segment (3rd gill-bearing); they are winged, with a serrated tip and often of two kinds. 2 or 3 pairs of arborescent gills. Lateral lobes on the first segment absent. Ventral scutes. Uncini from the 2nd setigerous segment, set in biserial opposite rows on a large number of segments.

403. Terebella ehrenbergi Grube. (Fig. 220, *a—c*).

Terebella ehrenbergi, Grube, 1870, p. 511: Gravier, 1906, p. 213, pl. IV, fig. 224—225: Hessle, 1917, p. 188: Fauvel, 1930a, p. 55; 1932, p. 226; 1939, p. 553.

Leprea ehrenbergi, Marenzeller, 1884, p. 201, pl. I, fig. 3.

Leprea inversa, Willey, 1905, p. 297, pl. VI, figs. 141—142, pl. VII fig. 197.

Eyes conspicuous. Three pairs of gills. 13 ventral scutes. The dorsal setae are absent in the last segments. Posterior bristles with broadly winged tips minutely pectinate and spirally twisted. Uncini biserial with 2—3

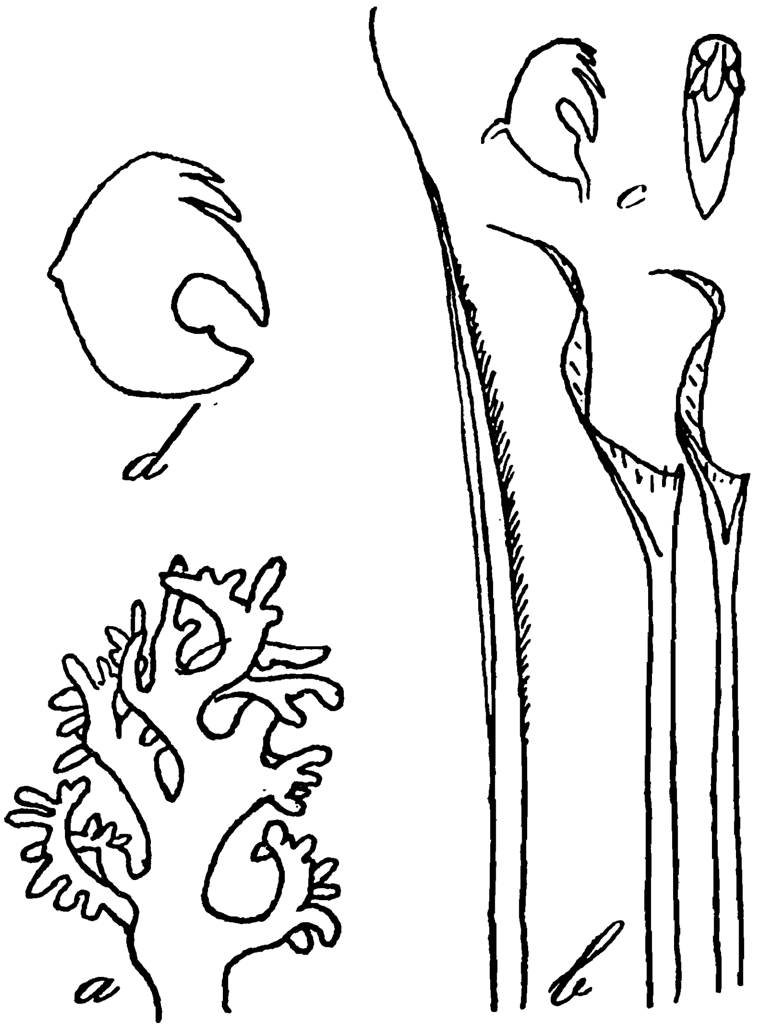

Fig. 220.—*Terebella ehrenbergi* Grube: *a*, gill; *b*, dorsal capillary bristles; *c*, hooks, side and front view (after Gravier). *Nicolea gracilibranchis* (Grube): *d*, thoracic hook (after Marenzeller).

main teeth above the fang and 2—3 rows of small denticles. Nephridial papillae long on segments 3, 6, 7 and 8, short and little conspicuous on segments 9, 10, 11 and 12. The nephridial papilla between the 1st and 2nd pair of gills is long and erect.

Length: 30—40 mm. by 2.5 mm.

Colour: in life, pink tentacles with pigment streaks or annular bands.

Occurrence: Diamond Island, Burma; Port Blair, Andaman Islands; Gulf of Mannar, Krusadai, Pamban, Rameswaram, Kilakarai.

Distribution: Japan, China Sea; Andaman Sea, Gulf of Mannar, Red Sea.

Genus PISTA Malmgren.

Thorax with 15—17 setigerous segments. Eyes sometimes present. One, two, or three pairs of bushy gills with a stout main stem. Lateral lobes often very conspicuous on the first segments. Distinct ventral scutes. Dorsal capillary setae with a smooth tip (very exceptionally serrated) Uncini from the 2nd setigerous segment; *those of the first segments with a long process or shaft.*

Key to the species of Pista.

1. Dorsal setae serrated	*indica* Fauvel, p. 422.
Dorsal setae smooth	2
2. Gills forming whorled tufts	*typha* Grube, p. 424.
Gills arborescent	3
3. Uncini of the first segments with a stout inferior shaft	4
Uncini of the first segments with a slender process	5
4. Shaft of the uncini of the first segment very broad .	*robustiseta* Caullery, p. 424.
-Shaft of the uncini of the first segment more slender ..	*fasciata* (Grube), p. 425.
5. Gill divisions few and very thick	*pachybranchiata* Fauvel, p. 428.
Gills densely ramified ..	6
6. Uncini of the first two uncinigerous segments differing from the following	*herpini* Fauvel, p. 427.
Uncini of the first two uncinigerous segments not unlike the following	*macrolobata* Hessle, p. 426.

404. Pista indica Fauvel. (Fig. 221, *a—d*).

Pista indica, Fauvel, 1940, p. fig. 1.

Body rather short and plump, abdomen cylindrical, with numerous short segments crowded together. 16

thoracic setigerous segments. Prostomium with an eyeless lobe bearing long, and rather thick, grooved tentacles. Buccal segment expanded into a dorsal arched lip. Obsolete lateral lobes on segments 2 and 3. 8–9 ventral scutes. Three pairs of bushy gills, all about the same size. Pygidium without papillae. Dorsal setae capillary with narrow wings and *a finely serrated tip.* Uncini from the 2nd setigerous segment. The first four uncinigerous tori

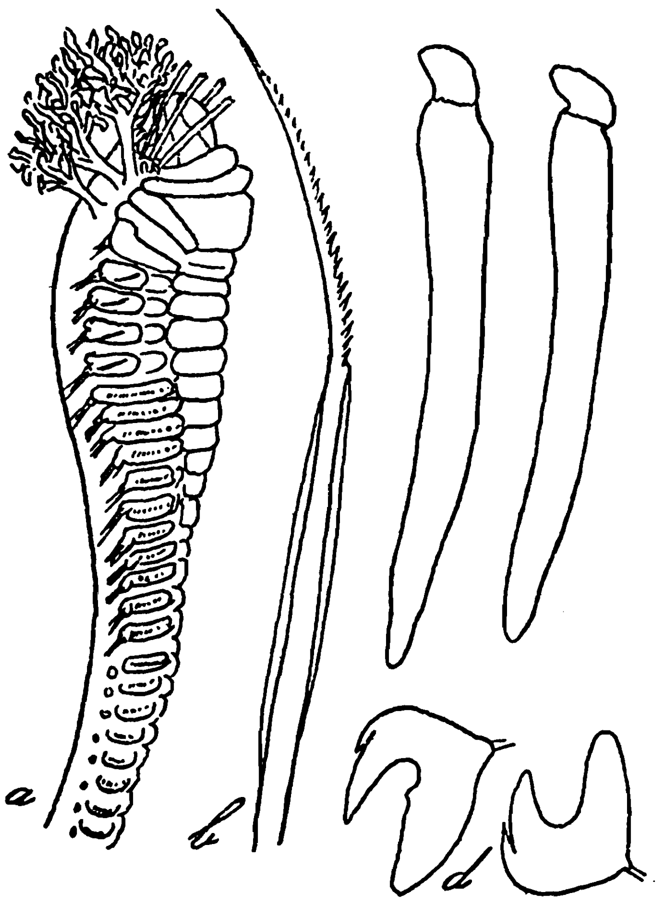

Fig. 221.—*Pista indica* Fauvel: *a,* anterior part, side view, tentacles cut off ×10; *b,* thoracic bristle ×400; *c,* thoracic hooks ×160; *d,* uncini ×520.

short, with a transverse row of *big, long, brown hooks* with smooth tips. On the two following tori a single row of small avicular uncini; next, the succeeding thoracic and abdominal segments bear two alternating rows.

Length: 15–20 mm. by 2–2.5 mm.

Decoloured, in spirit.

Occurrence: West Narrakal, Cochin State; Chepparam, Cheriya Kamakakudi, Ernakulam Backwater (17 specimens).

Remarks: With the exception of the serrated dorsal setae all the characters are those of the genus *Pista.*

405. Pista typha Grube. (Fig. 222, *a–c*).

Pista typha, Caullery, 1915, p. 77: Hessle, 1917, p. 155: Augener, 1927a, p. 154, fig. 17: Fauvel, 1932, p. 226, fig. 36.

Terebella (*Pista*) *typha*, Grube, 1878, p. 232, pl. XII, fig. 4.

17 thoracic setigerous segments. Two pairs of unequal gills with a long stem and an oval whorled tuft of filaments. Semicircular lateral lobes on the 2nd and 3rd

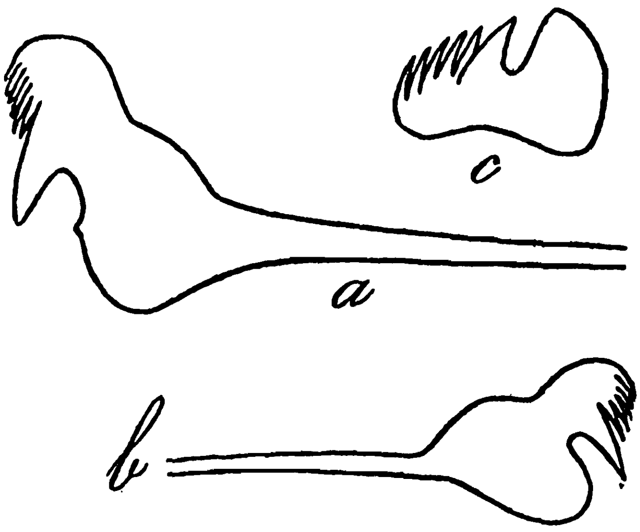

Fig. 222.—*Pista typha* Grube: *a*, hook from the 2nd uncinigerous segment ×500; *b*, hook from the 7th setigerous segment ×500; *c*, abdominal hook ×500.

segments. Uncini of the first segments with a long and slender basal shaft. Rather long nephridial papillae are conspicuous on the 3rd and 4th setigerous segments.

Length: 45 mm.

Occurrence: Bay of Bengal, Sandheads, Gangetic Delta; Laccadive Sea.

Distribution: Japan, Philippine Islands, Malayan Seas, South Australia; Bay of Bengal, Laccadive Sea.

406. Pista robustiseta Caullery. (Fig. 223, *a–e*).

Pista robustiseta, Caullery, 1915, p. 71, fig. 1A: Hessle, 1917, p. 159: Fauvel, 1932, p. 227, fig. 37.

17 thoracic setigerous segments. Eye-spots present. Two pairs of arborescent gills with stout stems. Conspicuous lateral lobes on the first three segments. Uncini of the first segments with *a stout, broad and long shaft*, becoming more slender in the following ones. About 14–19 ventral scutes.

Length: 20–30 mm.

Occurrence: Gulf of Oman, 609 fms.

Distribution: Japan; Malayan Sea; Gulf of Oman.

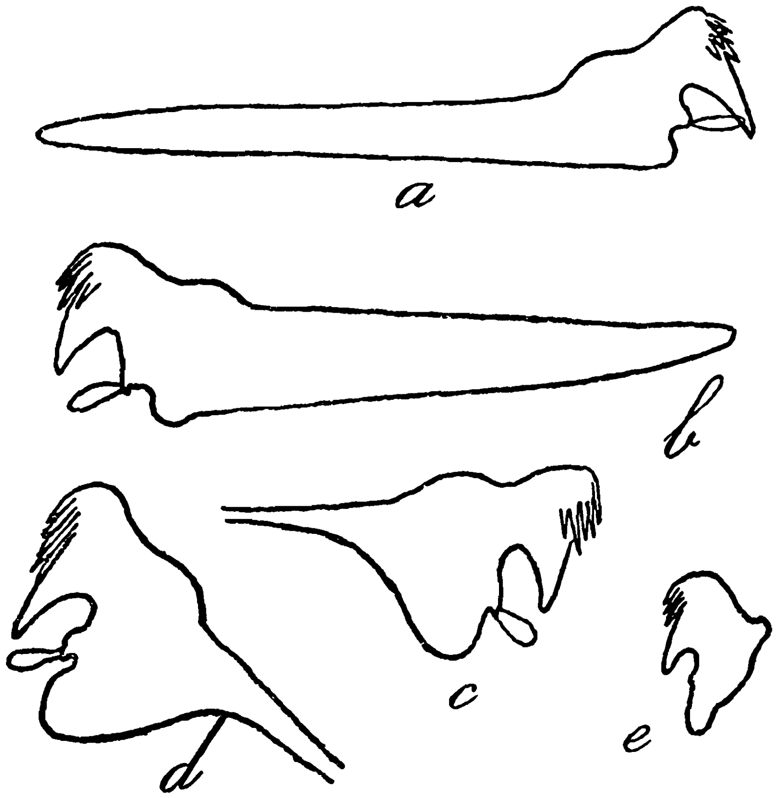

Fig. 223.—*Pista robustiseta* Caullery *a, b,* hooks from the first uncinigerous segment ×210; *c,* hook from the 3rd uncinigerous segment ×210; *d,* thoracic hook ×210; *e,* abdominal hook ×210.

407. Pista fasciata (Grube). (Fig. 224, *a–d*).

Pista fasciata, Marenzeller, 1884, p. 202, pl. I, fig. 4: Fauvel, 1932, p. 228, fig. 38.

Terebella (Physelia) fasciata, Grube, 1869, p. 513.

Terebella fasciata, Ehlers, 1908, p. 148.

17 thoracic setigerous segments. Two pairs of densely arborescent gills with stout stems. Lateral lobes very large on the buccal segment, which forms a ventral collar notched in the middle. Lobes of the 2nd segment very short. 15–17 ventral scutes. Uncini of all the thoracic segments with a *long, rather slender process.* The 3rd segment bears a small dorsal papilla on either side. The nephridial papillae on the 3rd and 4th segments lie above and slightly behind the foot.

Length: 60–80 mm. by 3–5 mm.

Occurrence: Bay of Bengal, 112–168 fms.

Distribution: Japan; Bay of Bengal, Red Sea, Zanzibar; Algoa Bay.

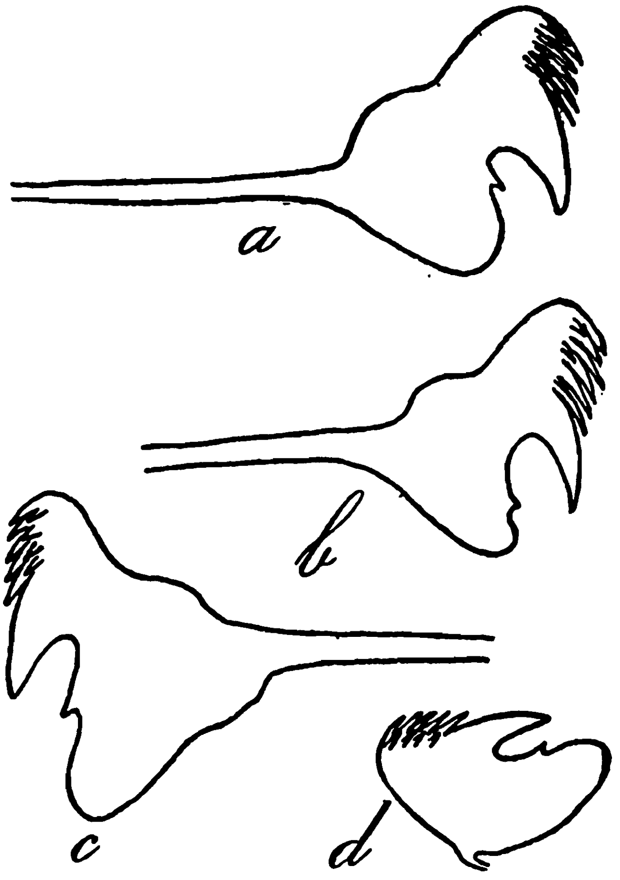

Fig. 224.—*Pista fasciata* (Grube): *a,* hook from the 2nd uncinigerous segment ×380; *b,* hook from the 3rd uncinigerous segment ×380; *c,* hook from the 11th uncinigerous segment ×380; *d,* abdominal hook ×380.

408. **Pista macrolobata** Hessle. (Fig. 225, *a–d*).

Pista macrolobata, Hessle, 1917, p. 157, pl. II, figs. 4, 36; Fauvel, 1932, p. 229, fig. 39.

17 thoracic setigerous segments. Eyes absent. Two pairs of arborescent gills. *Large lateral lobes on the buccal segment sheathing the head.* Lateral lobes on the 3rd and 4th, none on the 2nd. 17–20 rectangular ventral scutes. *All the thoracic uncini avicular, with very slender processes.* Nephridia in 3rd, 6th and 7th segments. Abdominal pinnules elongated, rectangular and protruding.

Length: 70 mm. by 4–5 mm.

Occurrence: Tor, Sinai Peninsula.

Distribution : Japan ; Red Sea.

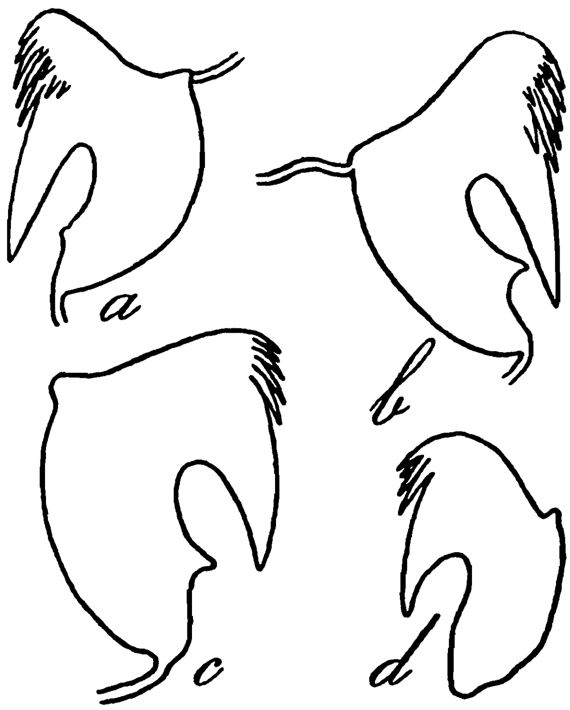

Fig. 225.—*Pista macrolobata* Hessle: *a*, hook from the first uncinigerous segment ×380; *b*, hook from the 2nd uncinigerous segment ×380; *c*, hook from the 15th uncinigerous segment ×380; *d*, abdominal hook ×380.

409. **Pista herpini** Fauvel. (Fig. 226, *a–h*).

Pista herpini, Fauvel, 1928, p. 160, fig. 2, *a–h*; 1930a, p. 57, fig. 16, *a–h*; 1932, p. 230.

Body narrow, slender, elongate, slightly swollen anteriorly. 17 thoracic setigerous segments. Prostomium large, without lateral folds. Eye-spots absent. Buccal segment expanded into two rounded lobes encompassing the prostomium and united ventrally by a fold ending in a notched lower lip. Second segment short, with a ventral transverse ridge, but without marked lateral lobes. On the 3rd segment two large, flattened, rounded lobes pointing forwards, or bent backwards. There are no lobes on the 4th segment (first setigerous) The 15—17 ventral shields are somewhat fused with the tori. Two pairs of branchiae, which may be either bushy or divided on a single plane; they are often borne on long stalks, the first pair being the larger. Nephridial papillae inconspicuous. Pygidium with terminal anus surrounded by short papillae. Dorsal setae capillary, broadly winged at the end, with a short smooth tip. The uncini are in a single row on the first six uncinigerous segments, double-alternating in the ten following (from the 7th to the 16th) uncinigerous or to the last thoracic (17th setigerous); behind that in a single

row. Uncini avicular with a broad base, a small ligament, a transverse row of 3—5 teeth and 2—3 rows of small denticles above the main fang. The uncini of the first two uncinigerous segments have a long narrow, faintly chitinised

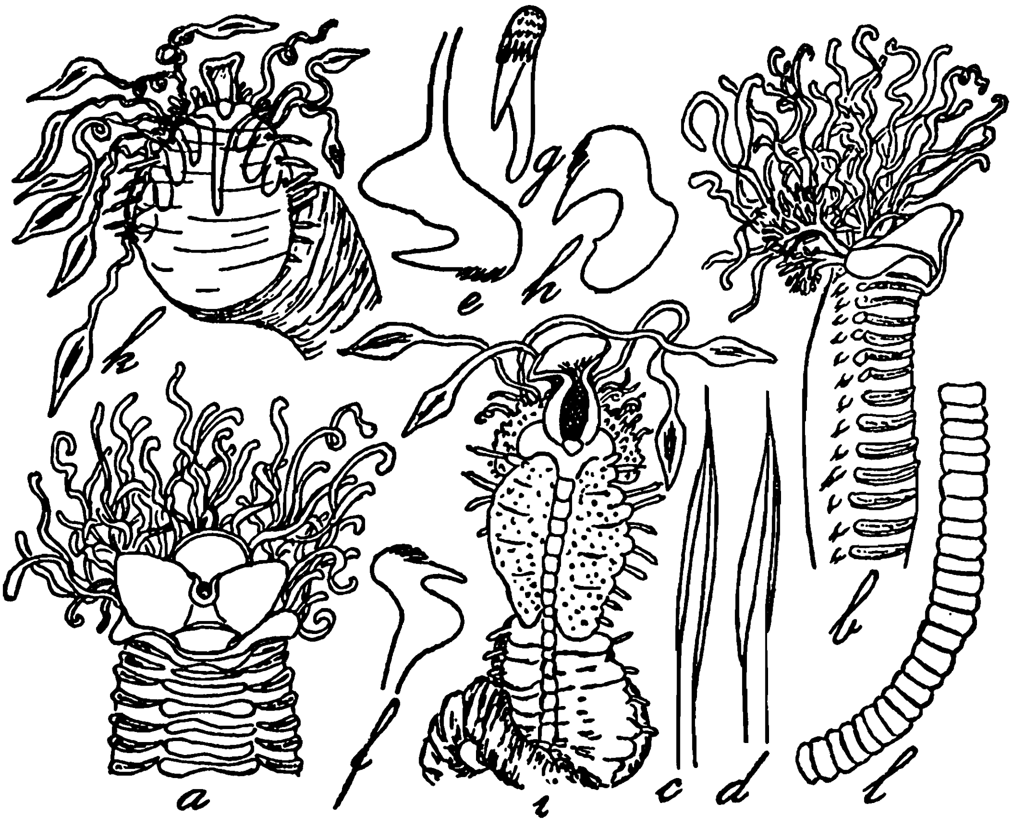

Fig. 226.—*Pista herpini* Fauvel: *a, b,* anterior region, ventral and side view ×6; *c, d,* capillary setae ×160; *e, f,* uncini from the first uncinigerous segment ×320; *g, h,* thoracic uncini, front and side view ×320. *Lysilla pambanensis* Fauvel: *i,* ventral side, contracted, most of the tentacular cirri fallen off ×6; *k,* anterior region, ventral side, much swollen, showing nephridia through the integument ×16; *l,* posterior region ×6.

process. Tendinous processes (*soies de soutien*) in the abdominal tori, which are rectangular pinnules standing out boldly. Tube membranaceous, cylindrical, with a coating of sand, fragments of shells and algae.

Length: 10—15 mm. by 2 mm.

Colour: Tentacular cirri white.

Occurrence: Gulf of Mannar, Pamban; Persian Gulf.

410. **Pista pachybranchiata** Fauvel. (Fig. 227, *a—f*).

Pista pachybranchiata, Fauvel, 1932, p. 231, pl. IX, figs. 1—6.

Body cylindrical, not swollen anteriorly, abdomen very long. 17 thoracic setigerous segments. Prostomium rather small, without lateral folds. A narrow streak of very small dark eye-spots. Buccal segment expanded into two large

rounded lobes encompassing the prostomium. On the 3rd segment, two rounded lobes. There are no lobes on the 4th segment (first setigerous) 15—18 ventral scutes, first rectangular, then hexagonal. Uncinigerous tori rather short. Two pairs of gills with few branches, very thick, subulate, simple or furcate; the second pair is slightly the smaller. Nephridial pores on 3rd, 4th and 5th setigerous segments. Uncini in a single row on the anterior uncini-

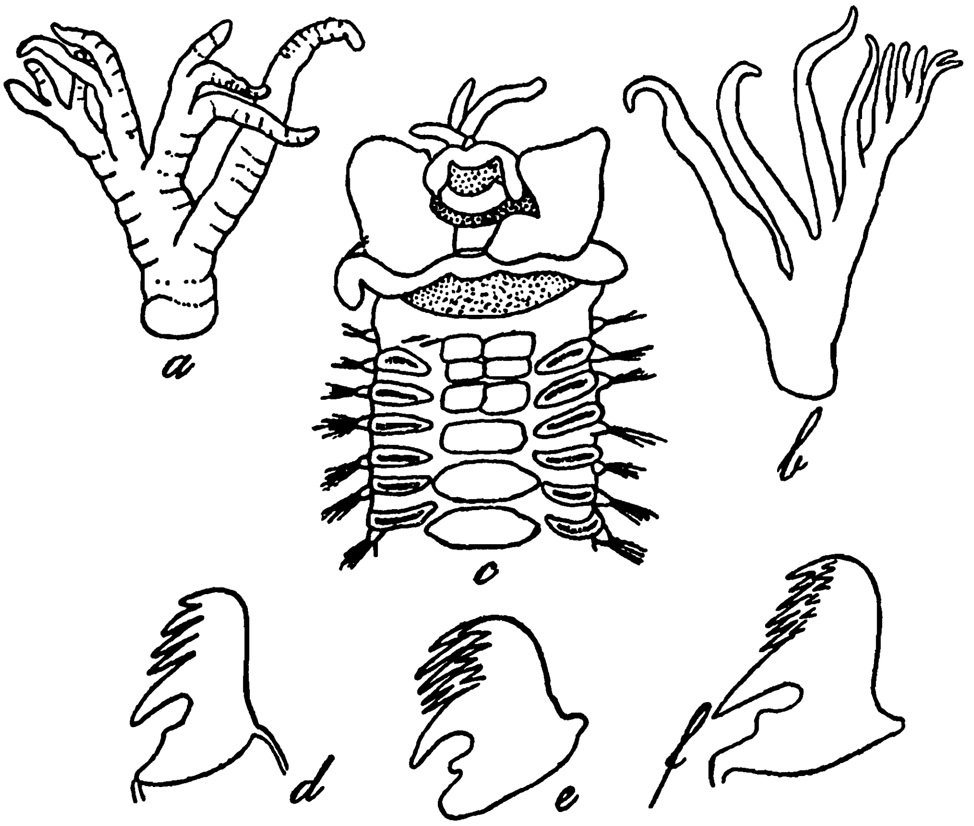

Fig. 227.—*Pista pachybranchiata* Fauvel: *a*, left gill of 2nd pair ×10; *b*, right gill of 2nd pair ×10; *c*, anterior end, ventral view ×5; *d*, uncinus from 2nd uncinigerous segment ×400; *e*, abdominal uncinus ×400; *f*, uncinus from 9th uncinigerous segment ×400.

gerous segments, double-alternating on the succeeding ones of the thorax. Uncini avicular, with a broad base, numerous transverse rows of small teeth above the main fang. They are hardly different from those of the first segments, and have only a very slender, faintly chitinised, basal process. The abdominal tori are small rectangular pinnules. Dorsal setae capillary, long, slender, with a single wing, appearing finely serrated under a high magnification. Pygidium? Tube?

Length: 100—120 mm. by 4—5 mm., feet not included, 6—6.5 mm. if setae included.

Colourless, in spirit.

Occurrence: Lacadive Sea, 1,150—1,170 fms.

Remarks: This species is an intermediate link between *Amphitrite* O. F. Müller and *Pista* Malmgren.

Subfamily *THELEPINAE* Hesslc.

Branchiae filiform. Uncini in simple rows.

Genus THELEPUS Leuckart.

Dorsal setae on a large number of segments. Two or three pairs of filiform gills, each in a transverse series. Numerous eye-spots. No lateral lobes on the first segments. Uncini commence on the 3rd *setigerous segment;* they are always in a single row.

Key to the species of Thelepus.

1. Two pairs of gills ..	*cincinnatus* Fabricius, p. 431.
Three pairs of gills	2
2. Abdomen tapering; pinnules square and projecting	*setosus.* Quatrefages.
Abdomen smooth, swollen, abruptly decreasing; pinnules small, lacking in the posterior part of the tail	*plagiostoma* Schmarda, p. 430.

Remarks: The cosmopolitan *Th. setosus* (Quatrefages) has not as yet been recorded from India, but it exists in the Red Sea and in Indochina. It differs chiefly from *plagiostoma* Schmarda in the condition of the posterior part of its abdomen. It is next to impossible to distinguish specimens when the tail is wanting; otherwise both species are easily discriminated.

411. **Thelepus plagiostoma** Schmarda. (Fig. 228, *a–f*)

Thelepus plagiostoma Schmarda, Augener, 1914, p. 95 (*Synonymy*): 1926a, p. 239: Fauvel, 1919, p. 455, fig. 10; 1932, p. 233.

Thelepus rugosus, Ehlers, 1901, p. 211; 1904, p. 59; 1908, p. 146.

Thelepsus japonicus, Marenzeller, 1884, p. 12, pl. II, fig. 4.

Thelepus crispus, Johnson, 1801, p. 428, pl. XVII, fig. 175–179.

Three pairs of filiform gills. Posterior part of the body generally swollen, but abruptly tapering to the pygidium. Dorsal setae nearly to the end of the body. Posterior segments very short, densely crowded, nearly smooth, and lacking uncini. Abdominal pinnules small,

not projecting. Uncini with a transverse row of two teeth above the main fang, and a basal knob.

Length: 100–180 mm. by 8–10 mm.

Colour: brown or reddish.

Fig. 228.—*Thelepus plagiostoma* Schmarda: *a, b,* dorsal bristles ×140; *c, d,* two uncini from one foot ×330; *e, f,* uncini, front view.

Occurrence: Malacca Strait.

Distribution: Chile, California, Japan, New Zealand, Australia; Indian Ocean.

412. Thelepus cincinnatus (Fabricius)

Thelepus cincinnatus, Hessle, 1917, p. 212: Fauvel, 1927a, p. 271, fig. 95, *i—m* (Synonymy); 1932, p. 233, fig. 46.

Two pairs of filiform gills. Abdomen long, gradually tapering, often coiled. Eye-spots numerous. Ventral scutes indistinct. Dorsal setae sometimes nearly to the end of the body. Abdominal pinnules rectangular, pro-

truding. The uncini have, above the main fang, a transverse row of two rather large teeth, a median tooth and often two small denticles. The basal knob is more or less enlarged at the tip (variable) Pygidium crenate.

Length: 100–200 mm. by 5–10 mm.

Colour: brown, pink or orange-yellow. Gills red.

Occurrence: Port Blair, Andaman Islands.

Distribution: Japan; Andaman Islands; Atlantic Ocean, Mediterranean Sea.

Genus **STREBLOSOMA** Sars.

Grymaea Malmgren: *Eugrymaea* Verrill.

Two or three pairs of clusters of filiform branchiae. Smooth-tipped dorsal setae commencing from the 2nd segment (first branchiferous) and extending to the abdominal region. Uncinigerous tori commencing on the *4th setigerous segment*. Uncini avicular, uniserial.

Key to the species of Streblosoma.

Abdominal pinnules sessile	*cespitosa* Willey, p. 433.
Abdominal pinnules standing well out	*persica* Fauvel, p. 432.

413. **Streblosoma persica** (Fauvel) (Fig. 229, Fig. 230, *c—m*)

Streblosoma persica, Fauvel, 1930a, p. 58.

Grymaea persica, Fauvel, 1911, p. 419, pl. XX, figs. 35–43.

Prostomium rounded, with a transverse row of eyes. Tentacles few, long, stout, grooved. Three pairs of gills, each of numerous simple, coiled filaments. Smooth-tipped capillary setae on nearly all the segments. First foot on the first branchial segment. Tori from the 4th setigerous segment. Uncini avicular, in single rows, retrogressive, with several rows of denticles on the vertex and a knob at the end of the manubrium. *Abdominal pinnules standing well out.* 20–25 ventral biannulate scutes.

Length: 30–40 mm. by 2–2.5 mm.

Occurrence: Gulf of Mannar, Krusadai Island, Pamban.

Distribution: Gulf of Mannar; Persian Gulf.

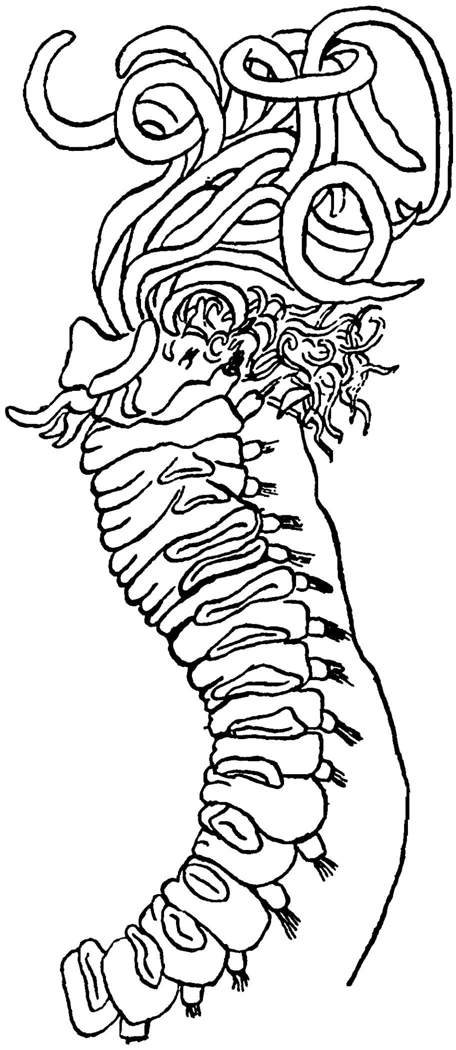

Fig. 229.—*Streblosoma persica* (Fauvel): side view ×10.

414. Streblosoma cespitosa (Willey) (Fig. 230, *a, b*)

Grymaea cespitosa, Willey, 1905, p. 305, pl. VII, figs. 164, 165; Fauvel, 1919, p. 457.

(?) *Phenacia exilis* Grube, Michaelsen, 1892, p. 20.

Prostomium with eyes. Tentacles stout, plainly grooved. Branchial filaments numerous, forming dense coils. Dorsal setae narrowly limbate. *First foot rather large*, on the first branchial segment. Uncini from the 4th setigerous segment; they are avicular with a button-like knob on the end of the manubrium. The thoracic tori graduate insensibly into the abdominal tori which are *sessile, not pinnuliform*. The dorsal capillary setae are *absent on the posterior half of the body*.

Length: 30 mm. by 3–4 mm.
Occurrence: Ceylon.
Distribution: India, Persian Gulf, Red Sea.

Subfamily *POLYCIRRINAE* Malmgren.

Cephalic lobe very large, foliaceous, bearing numerous grooved tentacles. *Branchiae absent.* Ventral scutes *paired* and narrow. Dorsal setae capillary, smooth or serrated.

Genus **POLYCIRRUS** Grube.

Branchiae absent. Cephalic tentacles very long, very numerous, filiform or swollen at the tips. Number of thoracic segments very variable. Uncini elongated toothed plates, all alike or of two kinds. Ventral scutes square, paired. Eyes absent. Nephridia well developed. Circulatory apparatus absent.

415. **Polycirrus coccineus** Grube. (Fig. 230, *n–q*).

Polycirrus coccineus, Fauvel, 1919, p. 458, pl. XI; 1930a, p. 59.
Anisocirrus decipiens, Gravier, 1906, p. 225, pl. V, figs. 235–238.

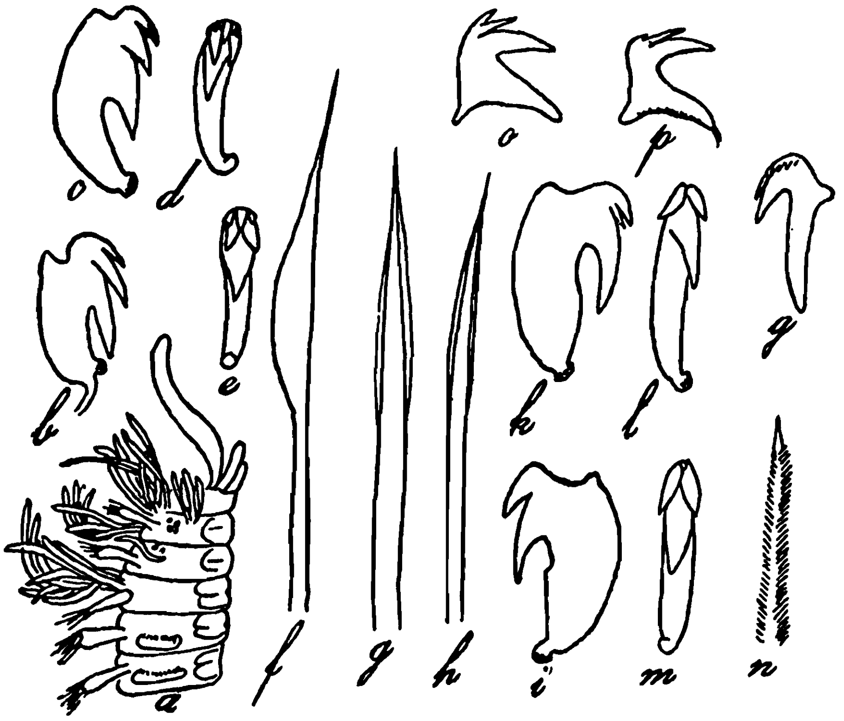

Fig. 230.—*Streblosoma cespitosa* Willey: *a*, anterior end, side view; *b*, hook (after Willey). *Str. persica* Fauvel: *c, d, e*, hooks, side and front view × 400; *f*, dorsal flattened bristle × 168; *g, h*, winged dorsal bristles ×168; *i, k, l, m*, hooks, side and front view × 400. *Polycirrus coccineus* Grube: *n*, tip of a capillary bristle ×248; *o*, thoracic hook ×400; *p, q*, abdominal hooks, side and front view × 400.

Tentacular cirri very numerous, entangled, more or less enlarged at the tip into a tongue-shaped process. 16—20 thoracic setigerous segments bearing *boldly serrated bristles.* Thoracic uncini on the last thoracic segments, avicular with a broad short base. Abdominal uncini with a narrow elongated base.

Length: 60—80 mm.

Colour: Tentacular cirri yellow.

Occurrence: Gulf of Mannar, Pamban, Krusadai Island.

Distribution: India, Persian Gulf, Red Sea.

Genus LYSILLA Malmgren.

Branchiae absent. Dorsal setae capillary, very small. *Uncini absent.*

416. **Lysilla pambanensis** Fauvel. (Fig. 226, *i—l*).

Lysilla pambanensis, Fauvel, 1928, p. 162, fig. 2, *i—l;* 1930a, p. 59, fig. 16, *i—l.*

Body often much swollen anteriorly, ventral side convex, dorsal concave; posterior region narrow, cylindrical. In the anterior region the skin is covered with small papillae, glandular, rounded, hemispherical or flattened and often little conspicuous. In the posterior region the superficial rings are often very distinct, even nearly moniliform. There are 13—18 thoracic segments bearing dorsal setae. A wide, frilled, prostomial lobe, eye-less and bearing numerous tentacular cirri, some cylindrical slender, spirally twisted, others much stouter, strongly enlarged at the tip and grooved. A prominent upper lip, hollowed, spoon-like. A small triangular fleshy knob under the lower lip. First segment as a large Y-shaped pad with bent edges. The ventral shields are short, narrow, square, sunk into a ventral groove. They are not visible when the thoracic region is much swollen. Small pointed nephridial papillae on the three first setigerous segments, sometimes on the next seven; a swelling with a small central spot (nephridiopore?) is visible on the base of the foot. It appears to have 8—9 pairs of nephridia, the first 4—5 pairs, often visible through the transparent teguments, being short and oval. The dorsal capillary setae, very slender and smooth, noticeably emerge from the long cylindrical foot which is slightly enlarged at the tip. *Tori and uncini are utterly wanting,* as well in the abdomen as in the thorax. Anus terminal, without papillae.

Length: up to 90 mm. and more, by 2 mm.

Colour: in spirit, yellowish-white, more or less closely dotted with rusty brown. Tube unknown.

Occurrence: Pamban, Rameswaram.

Subfamily *CANEPHORINAE* Malmgren.

A single branchia, quadripartite, pectinated. Ventral scutes absent. Dorsal setae smooth or striated. Uncini of two kinds.

Genus TEREBELLIDES Sars.

Cephalic lobe rounded-ovate with a dense series of grooved tentacles. A single dorsal gill with four pectinate divisions. Dorsal setae long, tapering and winged. Uncini uniserial, of two kinds: (1) elongated, acicular, thoracic; (2) pectiniform, abdominal.

417 **Terebellides stroemi** Sars. (Fig. 231, *i—q*).

Terebellides stroemi, Malmgren, 1865, p. 396, pl. XX, fig. 48: Augener, 1926, p. 343: Fauvel, 1927a, p. 291, fig. 100, *i—q* (Synonymy); 1932m, p. 234.
Terebellides ypsilon, Grube, 1878, p. 241, pl. XIII, fig. 6.

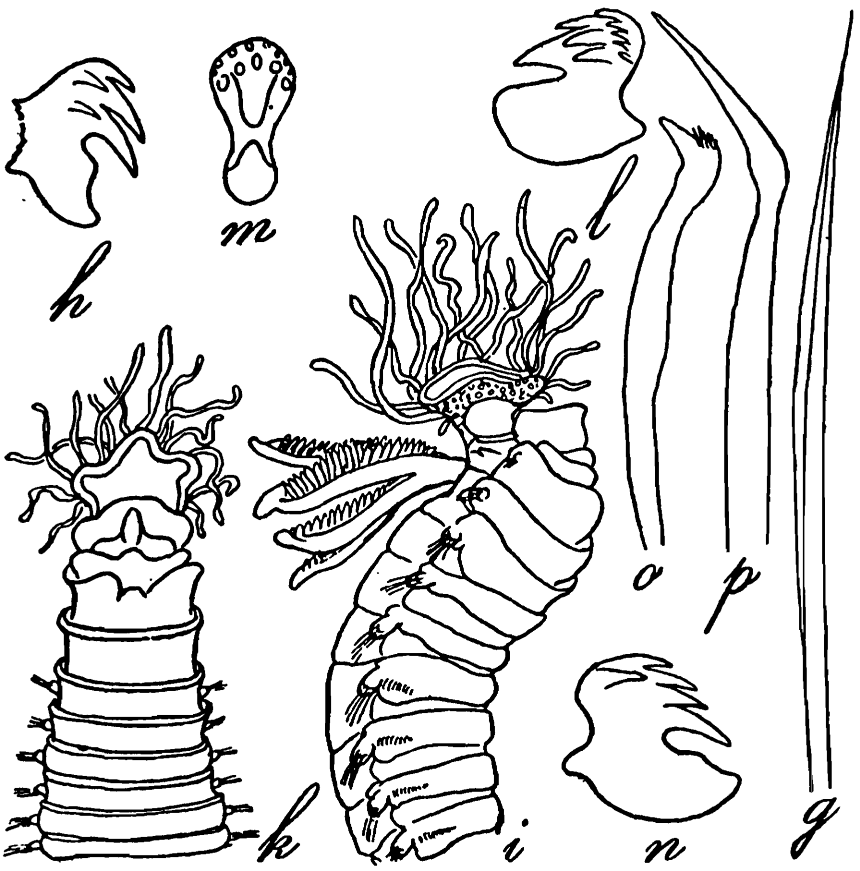

Fig. 231.—*Terebellides stroemi* Sars: *i, k*, anterior region, side and ventral view ×8; *h, l, m, n*, uncini, side and front view ×600; *o*, ventral thoracic hook ×400; *p*, kneed acicular bristle from the 6th segment ×150; *g*, dorsal bristle ×150.

Terebellides intoshi, Caullery, 1915, p. 111, fig. 1.
(?) *Terebellides sieboldi* Kinberg, Ehlers, 1904, p. 61.
Aponobranchus perrieri, Gravier, 1906, p .232, pl. V, figs. 239—242.

Body rather short, 50—60 segments. 18 thoracic setigerous segments. Eyes absent. A single gill, with a stout stem bearing four pectinate lobes with reniform lamellae. It is inserted on segments 3—4. Segments 3 to 6 have, ventrally, a free anterior border. Dorsal setae commence on the 3rd segment. Uncini of the 6th setigerous segment are long, acicular, geniculate, unidentate hooks; those of the next twelve segments end in a blunt tip with small denticles above. Abdominal uncini avicular, with a short base and transverse rows of teeth above the main fang. Abdominal pinnules distinct. Tube membranous, coated with mud.

Remarks: The peculiar gill assumes very different appearances according to the more or less contracted condition of the organ, depending on preservation or regeneration (it is sometimes easily deciduous)

Length: 30—60 mm. by 2—8 mm.

Occurrence: Banka Strait; Andaman Islands; Off Akyab, Burma; Bay of Bengal; Ganjam Coast, Madras Coast; Laccadive Sea.

Distribution: Pacific, Indian and Atlantic Oceans; Mediterranean Sea, Arctic and Sub-Antarctic Oceans.

Incertae sedis

418. **Polymnia labiata**, Willey, 1905, p. 298, pl. VI, fig. 143—145.

The figures of the uncini are more sugestive of a *Pista* than of a *Polymnia* but the description of the unique specimen is too incomplete for an accurate identification.

Occurrence: Trincomalee Pearl banks.

419. **Physelia viridis**, Schmarda, 1861, p. 41, pl. XXV, fig. 201; from Ceylon, is perhaps a *Loimia* (?).

420. **Neottis gracilis**, Kinberg, 1855.

From Singapore: is very likely a *Thelepus* or a *Streblosoma*.

Family SABELLIDAE Malmgren.

Body somewhat cylindrical or slightly flattened; divided into two regions: (1) thoracic consisting of a few segments, with dorsal capillary setae and ventral uncini-

gerous tori, and (2) abdominal, much longer, with dorsal uncinigerous tori and ventral capillary setae. Ventral glandular shields divided by a longitudinal groove. First segment with a more or less developed, entire or notched, collar. Gills forming a funnel surrounding the mouth, they are composed of two semi-circular, or spiral, lobes bearing a number of filaments or radioles, with two rows of barbules. *Operculum absent.* Tube formed of mucus, or membranous, or horny.

Key to the genera of Sabellidae.

1.	Thoracic tori with avicular uncini	2
	Thoracic tori with long hooks	9
2.	Thoracic tori with a single row of avicular hooks. Pickaxe-shaped setae absent	3
	Thoracic tori with a row or avicular hooks and a row of pickaxe-shaped setae ..	5
3.	Dorsal setae of two kinds	*Laonome* Malmgren, p. 446.
	Dorsal setae of one kind	4
4.	Gill filaments with dorsal stylodes	*Dasychone* Sars, p. 442.
	Gill filaments without dorsal stylodes	*Sabellastarte* Kröyer, p. 445.
5.	Gills filaments with subterminal eyes	*Branchiomma* Kölliker, p. 443.
	Gills filaments without subterminal eyes	6
6.	Dorsal thoracic setae of one kind only	7
	Dorsal thoracic setae of two kinds	8
7.	Branchial lobes symmetrical, semi-circular	*Sabella* Linnaeus, p. 439.
	Branchial lobes asymmetrical, spirally coiled	*Spirographis* Viviani, p. 440.
8.	Setae of the first thoracic segment set in a tuft	*Potamilla* Malmgren, p. 448.
	Setae of the first thoracic segment set in slanting rows ..	*Hypsicomus* Grube, p. 447.

9. Abdominal long hooks	*Manayunkia* Leidy, p. 452.
Abdominal avicular uncini	*Jasmineira* Langerhans, p. 450.

Genus SABELLA Linnaeus.

Two branchial lobes equal, semi-circular, not spirally coiled. In the thorax, dorsal winged setae, ventral avicular uncini and pickaxe-shaped hooks. In the adbomen, dorsal avicular uncini and ventral winged setae. A collar. Membranous tube coated with fine ooze.

Key to the species of Sabella.

On the base of the gills 4 glandular pads	*porifera* Grube, p. 439.
Glandular pads absent	*melanostigma* Schmarda, p. 439.

421. Sabella porifera Grube. (Fig. 232, *a–f*).

Sabella porifera, Grube, 1878, p. 252, pl. XIV, fig. 3: Fauvel, 1930, p. 260; 1940, p.

Sabella fusca, Gravier, 1908, p. 71, pl. V, figs. 243–245: Fauvel, 1927, p. 302, fig. 104.

Eurato porifera, Willey, 1905, p. 309, pl. VII, figs. 1–3.

Branchial fan well developed. At the base of the gills four stout, brown, glandular lobes form pads of a very peculiar kind. Body broad and short, bearing between the two divisions of the feet small eye-spots, occasionally wanting.

Length: 60–80 mm. by 7–8 mm.

Colour: Body pink, gills pale, streaked with brown.

Occurrence: Andaman Islands; Ceylon.

Distribution: Australia; Indian Ocean, Red Sea.

422. Sabella melanostigma Schmarda. (Fig. 232, *h–n*)

Sabella melanostigma, Johansson, 1927, p. 121 (Synonymy): Fauvel, 1939, p. 23; 1940, p.

Sabella bipunctata Baird, Fauvel, 1914, p. 149, pl. VIII, figs. 18–21; 1927, p. 301, fig. 103, *h–n*.

Sabella guinensis, Augener, 1918, p. 565, pl. VII, figs. 247–249.

Branchial filaments with several pairs of eyes on the dorsal side. Collar low, erect, broadly notched on the dorsal side. The ventral groove is missing or hardly cons-

picuous in the posterior part. A big, dark purple spot above either parapodium. Pickaxe setae very peculiar, ending in a very thin, transparent membrane curved in the shape of a shovel or coal scuttle.

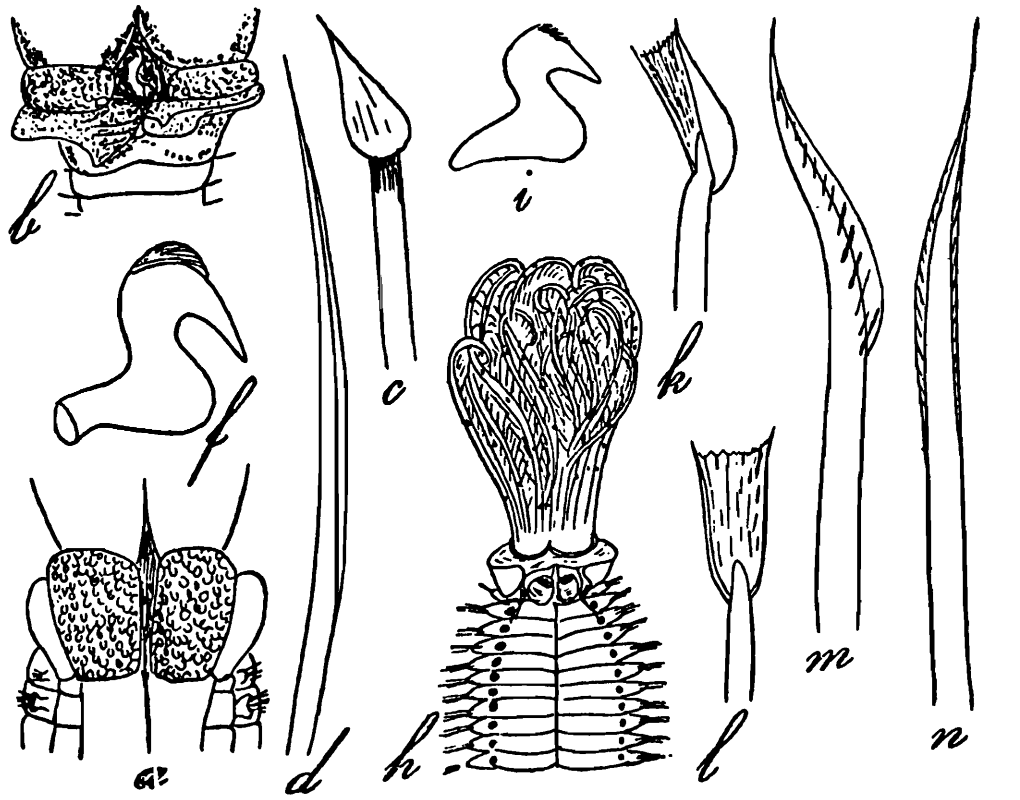

Fig. 232.—*Sabella porifera* Grube: *a, b,* anterior region, dorsal and ventral view, enlarged; *c,* pick-axe seta (after Gravier); *d,* dorsal thoracic bristle ×80; *f,* thoracic hook ×160. *S. melanostigma* Schmarda: *h,* anterior part, dorsal view (after McIntosh); *i,* thoracic hook ×170; *k, l,* shovel pick-axe setae quarter and front view ×400; *m, n,* thoracic bristles ×120.

Length: 100—150 mm.

Colour: in life, gills with violet brown stripes. Body greenish, thoracic tori lined with a violet or purple streak.

Occurrence: Port Blair, Andaman Islands.

Distribution: Pacific Ocean, Japan, Malaysia; Andaman Islands; Atlantic Ocean, West Indies; Gulf of Guinea.

Genus SPIROGRAPHIS Viviani.

Branchial lobes asymmetrical, one semi-circular, the other spirally coiled. Branchial filaments devoid of eyes and dorsal stylodes. Thoracic dorsal setae capillary, winged. Ventral thoracic tori with avicular uncini and pick-axe-shaped setae. Dorsal abdominal uncini avicular; ventral setae capillary, winged. A quadrilobate collar. Tube membranous coated with fine ooze and algae.

423. Spirographis spallanzanii Viviani. (Fig. 233, *a–l*)

Spirographis spallanzanii, Fauvel, 1927, p. 309, fig. 105, *a–h*: Johansson, 1927, p. 133 (Synonymy).

Spirographis tricyclia, Schmarda, 1861, p. 37, pl. XXIII, fig. 193.

Body cylindrical, abruptly tapering behind. Branchial lobes very unequal; one is circular and the other 2–6 times spirally coiled. Two short slender grooved palps.

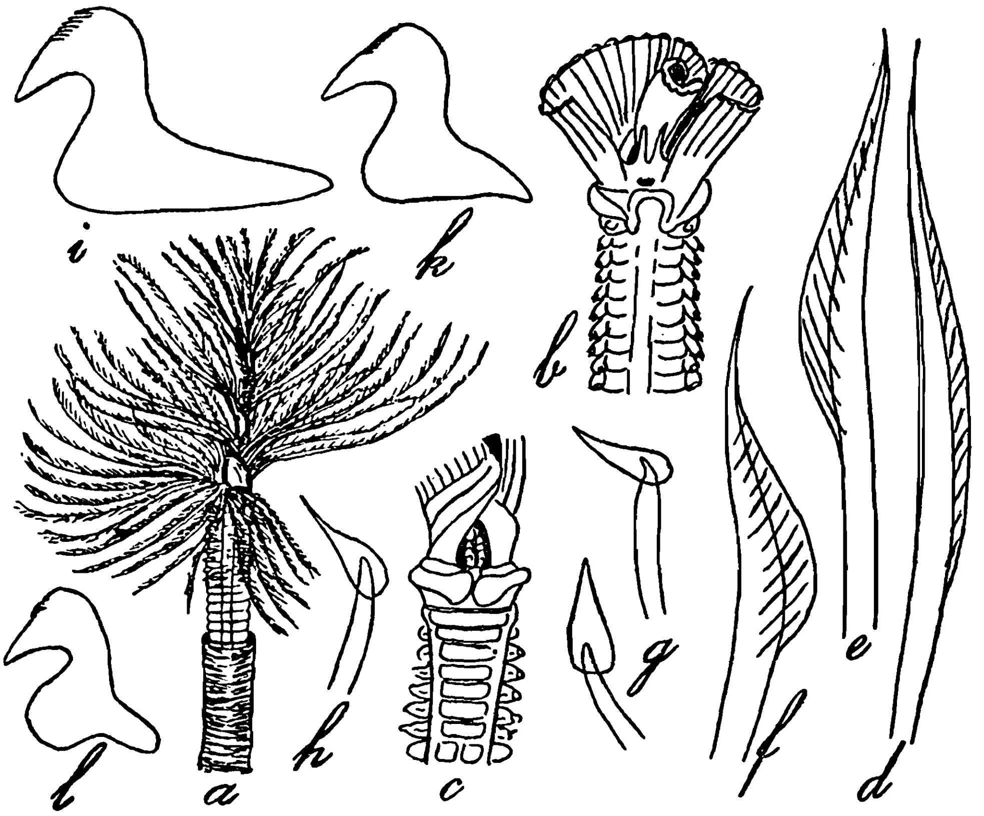

Fig. 233.—*Spirographis spallanzanii* Viviani: *a*, with branchial tuft expanded; *b*, *c*, anterior region, dorsal and ventral view ×2 (after Soulier); *d*, *e*, thoracic dorsal bristles ×185; *f*, abdominal capillary bristle ×185; *g*, *h*, pick-axe setae ×132; *i*, thoracic uncinus ×185; *k*, *l*, abdominal uncini ×185.

Collar with two dorsal lobes and two ventral ones, thick and turned down. Pygidium with two small rounded papillae. Tube tough, erect.

Length: 200–300 mm. by 8–10 mm.

Colour: very variable. Gills more or less streaked. Body brown.

Occurrence: Ceylon.

Distribution: Indo-China, Malay Archipelago; Indian Ocean, India; Atlantic Ocean, Mediterranean Sea.

Genus DASYCHONE Sars.

Body short. Both branchial lobes equal. Dorsal stylodes (appendages) on the branchial filaments, which also bear paired eye-spots. Subterminal eyes absent. A collar. Pickaxe-shaped setae absent. Abdominal dorsal uncini avicular and ventral setae winged.

Key to the species of Dasychone.

Dorsal stylodes long, narrow and free	*cingulata* Grube, p. 442.
Dorsal stylodes small, short, appressed, hardly raised	*serratibranchis* Grube, p. 442.

424. Dasychone cingulata Grube. (Fig. 234, *f—h*)

Dasychone cingulata, Willey, 1905, p. 308, pl. VII, figs. 170—173: Augener, 1914, p. 122 (Synonymy): Fauvel, 1930b, p. 1932, p. 236.

Branchiomma cingulata, Johansson, 1927, p. 61.

Branchial lobes equal, semi-circular, not spiral, Gill-filaments with paired dorsal, long and slender, stylodes and pairs of small eyes. Lateral eye-spots between dorsal and ventral rami.

Length: 10—30 mm. by 2—3 mm.

Colour: Body with scattered dark spots.

Occurrence: Burma coast, Mergui; Andaman Islands; Gulf of Mannar, Pamban.

Distribution: Pacific Ocean; Indian Ocean, Arabian Sea, Persian Gulf, Red Sea.

425. Dasychone serratibranchis Grube. (Fig. 234, *i*)

Dasychone serratibranchis, Grube, 1878, p. 262, pl. XIV, fig. 7: Ehlers, 1907, p. 28: Augener, 1926a, p. 257: Fauvel, 1932, p. 236.

Branchial lobes equal, semi-circular, not spiral. Dorsal stylodes short, appressed, appearing as small triangular serrations of the branchial filaments. A few paired branchial eye-spots. Body with lateral eye-spots.

Length: 15—30 mm. by 2—3 mm.

Colour: Gills with white, yellow and purple bands.

Occurrence: Mergui; Andaman Islands; Pamban.

Distribution: Philippine Islands, Indochina, New-Zealand, Australia; India.

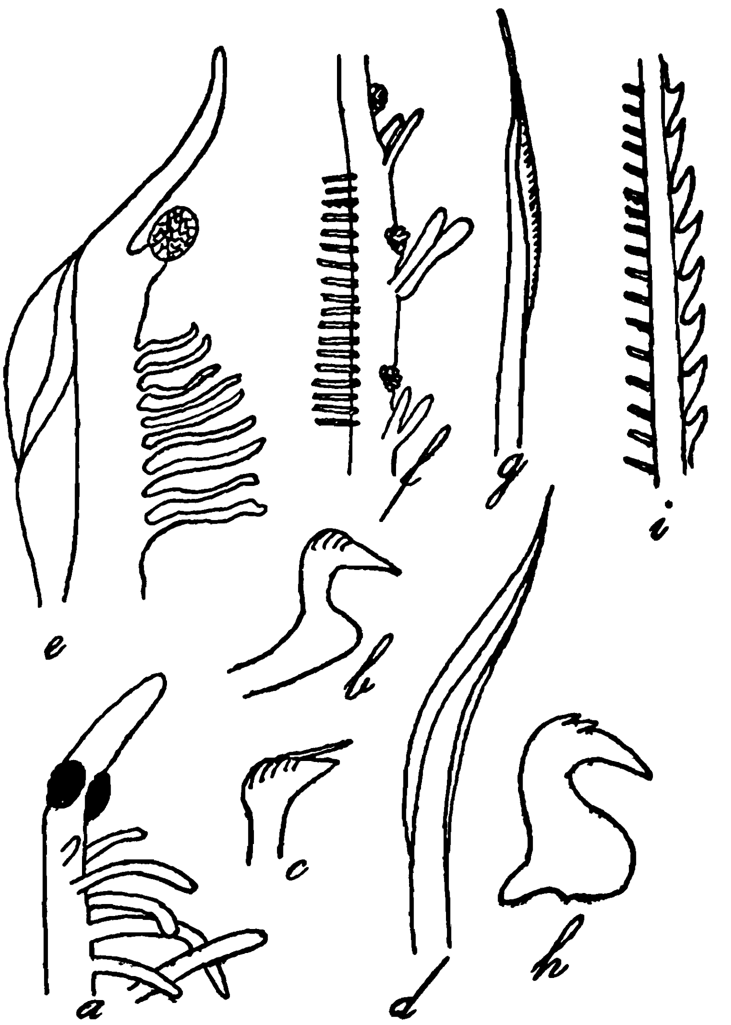

Fig. 234.—*Branchiomma pacificum* (Johansson): *a,* gill-tip, with eyes; *b,* thoracic hook ×295; *c,* pick-axe seta ×630; *d,* thoracic bristle × 295 (after Johansson). *Br. intermedium* Beddard: *e,* top of gill, with eye (after Beddard). *Dasychone cingulata* Grube: *f,* portion of a gill's radiole, with eyes and stylodes; *g,* dorsal thoracic bristle; *h,* thoracic hook (after Willey). *D. serratibranchis* Grube: *i,* part of a gill's radiole with stylodes.

Genus **BRANCHIOMMA** Kölliker.

Megalomma Johansson.

Body elongated. Branchial lobes symmetrical, semicircular, not spiral. Branchial filaments destitute of dorsal stylodes. Subterminal compound eyes. A two- or four-lobed collar. Capillary setae winged. In the thorax avicular uncini and pickaxe-shaped setae. Tube coated with sand.

Key to the species of Branchiomma.

Collar low and very slanting. A double fold overlying the eyes near the tip of the gills	*intermedium* Beddard, p. 444.
Collar high, hardly slanting; tip of the gills without any fold	*pacificum* (Johansson), p. 444.

426. **Branchiomma pacificum** (Johansson) (Fig. 234, *a—c*).

Megalomma pacifica, Johansson, 1927, p. 130, fig. 151.

Branchiomma pacificum, Fauvel, 1932, p. 237.

(?) *Branchiomma quadrioculatum,* Willey, 1905, p. 307, pl. VII, figs. 168—169.

(?) *Branchiomma acrophthalmos* Grube, Willey, 1905, p. 306, pl. VII, figs. 166—167.

Eight thoracic segments with short, elongated, narrow-winged dorsal setae, avicular uncini with a rather long base and pickaxe-shaped setae. Abdominal capillary setae slightly broader than in the thorax, but not paleae-like (in adult specimens; paleae-like in the very young). Collar hardly slanting; dorsal lobes rather low; ventral lobes higher with two lateral and a median deep notches. Subterminal eyes very large, encircling about half of the filament and appearing as double eyes.

Length: 20—30 mm. by 2 mm.

Occurrence: Moscos Islands, Burma; Ceylon (?)

Distribution: Gilbert Islands, Pacific Ocean; Moscos Islands, India (?)

Remarks: Very close to *B. vesiculosum* (Montagu) from Europe and very likely conspecific.

427. **Branchiomma intermedium** Beddard. (Fig. 234, *e*).

Branchiomma intermedium, Beddard, 1887, p. 261, pl. XXI, figs. 4—7: Fauvel, 1932, p. 237.

Eight thoracic setigerous segments with long and short, narrow-winged, dorsal setae, avicular uncini and pickaxe-shaped setae. Abdominal capillary setae hardly broader, not enlarged into paleae-like structures. *Collar very low and slanting* to the 3rd setigerous segment. Branchial lobes borne on long stalks marked with a dark stripe. Gill filaments with a single subterminal eye. Towards the extremity there is a double fold, just overlying the eye. Tube of considerable thickness, coated with mud and broken shells.

Length: 100 mm.

Colour: pale brown, gills darker.

Occurrence: Paway Island, Mergui Archipelago.

Distribution: Mergui Archipelago.

Genus SABELLASTARTE Krôyer.

Branchial lobes symmetrical. Branchial filaments destitute of dorsal stylodes. Capillary setae winged, not paleae-like. In the thorax, only ventral avicular uncini; *pickaxe-shaped setae absent.* In the abdominal region, dorsal avicular uncini and ventral capillary setae.

428. Sabellastarte indica Savigny. (Fig. 235, *a—h*)

Sabellastarte indica, Augener, 1914, p. 115, pl. I, fig. 20 (Synonymy): Pruvot, 1930, p. 85, pl. 11, figs. 39—50: Fauvel, 1932, p. 238: Monro, 1931, p. 45.

Eurato notata, Willey, 1905, p. 310, pl. VII, figs. 174—175.

Eurato sancti-josephi, Gravier, 1903, p. 105, pl. VII, figs. 281—283.

Sabella pottaei, Quatrefages, 1865, p. 436.

(?) *Sabella melanochlora*, Schmarda, 1861.

Body large, stout, dark. About 8 thoracic segments with dorsal capillary setae, all similar with a narrow wing, and ventral avicular uncini; pickaxe-shaped setae absent. Abdominal ventral setae with a broader wing. Collar well developed, with two dorsal lobes and a ventral lobe ending in two processes. Gill-filaments numerous and densely crowded, eyeless, and without dorsal stylodes. It differs from *Sabella* chiefly in the absence of pickaxe-shaped bristles in the ventral thoracic tori and by its *very numerous and thickly crowded gill-filaments,* which look as though set in two concentric rows in contracted specimens. Tube membranous, coated with fine mud.

Length: 90—120 mm.

Colour: in spirit, dark-violet or grey with scattered dark spots.

Occurrence: Burma coast, Mergui, Akyab; Andaman Islands; Madras; Ceylon; Karachi.

Distribution: Japan, China Sea, Malayan Sea, New Caledonia, Australia; Indian Ocean, Red Sea; Tropical Atlantic Ocean.

Genus LAONOME Malmgren.

Branchial lobes symmetrical, semi-circular, not spiral. Branchial filaments without dorsal stylodes. No subterminal eyes. A four-lobed collar. In the thorax dorsal capillary setae *of two kinds;* ventral uncini, *no pickaxe-shaped setae.* In the abdomen, dorsal avicular uncini and ventral capillary setae.

429. Laonome indica Southern. (Fig. 235, *d–h*)

Laonome indica, Southern, 1921, p. 652, pl. XXX, fig. 20.

Body slender. 6 thoracic segments with dorsal long, slender capillaries with narrow wing and long tapering

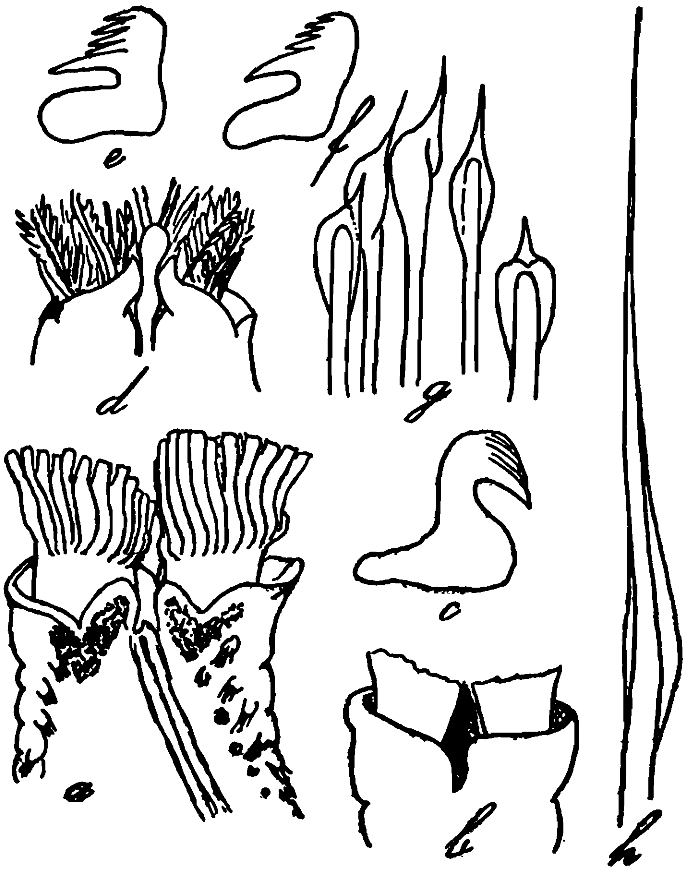

Fig. 235.—*Sabellastarte indica* Savigny: *a,* anterior part, dorsal view, enlarged; *b,* collar, ventral view; *c,* thoracic hook ×190 (after Pruvot). *Laonome indica* Southern: *d,* collar segment, ventral view ×56; *e,* hook from the 2nd segment ×800; *f,* hook from the 8th segment ×800; *g,* spatulate thoracic bristles ×560; *h,* capillary bristle from the 8th segment ×600 (after Southern).

tips and setae with spatulate tips terminating in a long fine point. Uncini with a stout rounded base and 4—5 rows of teeth above the main fang. In the abdomen, dorsal uncini, diflering very slightly from those of the thorax, with rounded base more oblique, and ventral capillary

setae with short and broad wings and a long and slender tip. The gills are unconnected by a membrane. There are two short palps and two ventral lobes projecting forwards and ending in a pointed tip. No eyes observed. Tube unknown.

Length: 28 mm. by 2 mm.

Occurrence: Chilka Lake.

Genus HYPSICOMUS Grube.

Body long and slender, Branchial lobes symmetrical. Gill-filaments with rows of eyes. Dorsal stylodes absent. A collar. Capillary setae of the first thoracic segment *set in a slanting row*. Thoracic dorsal setae *of two kinds*: (1) capillary, and (2) paleae-like. Ventral avicular uncini and pickaxe-shaped setae. In the abdomen, dorsal avicular uncini and ventral capillary setae and paleae.

430. **Hypsicomus phaeotaenia** (Schmarda) (Fig. 236, *a–l*)

Hypsicomus phaeotaenia, Gravier, 1908, p. 84, pl. VI, figs. 255–259: Fauvel, 1927a, p. 312, fig. 108 (Synonymy); 1932, p. 238: Willey, 1905, p. 307.

Hypsicomus pigmentatus, Gravier, 1908, p. 81, pl. VI, figs. 252–254.

Hypsicomus marenzelleri, Gravier, 1908, p. 78, pl. VI, figs. 247–251.

Sabella phaeotaenia, Schmarda, 1861, p. 35, pl. XXII, fig. 188.

Sabella fusco-taeniata, Grube, 1874, p. 328.

Branchial lobes *borne on a long stalk*. Gill-filaments bearing on their rachis two longitudinal rows of simple eye-spots, single, or in more or less numerous groups. Collar low and straight, entire or notched. Short setae of the first setigerous segment set in a sigmoid, slanting row. Paleae spoon-shaped with a rounded winged end, with, or without, a sharp tip; and capillary setae. In the abdomen, dorsal avicular uncini and ventral capillary setae with broader paleae. Tube membranous, transparent.

Length: 40–60 mm.

Colour: Very variable; body dark with pale feet and tori. Gills banded with yellow, brown, red or violet.

Occurrence: Mergui; Nankauri Harbour, Nicobar Islands; Great Coco Island; Ceylon; Gulf of Mannar, Pamban, Kilakarai; Maldive Archipelago.

Distribution: Japan, China Sea, New Caledonia, Indo-China, Malay Archipelago, Australia, Indian Ocean, Persian Gulf, Red Sea; Atlantic Ocean.

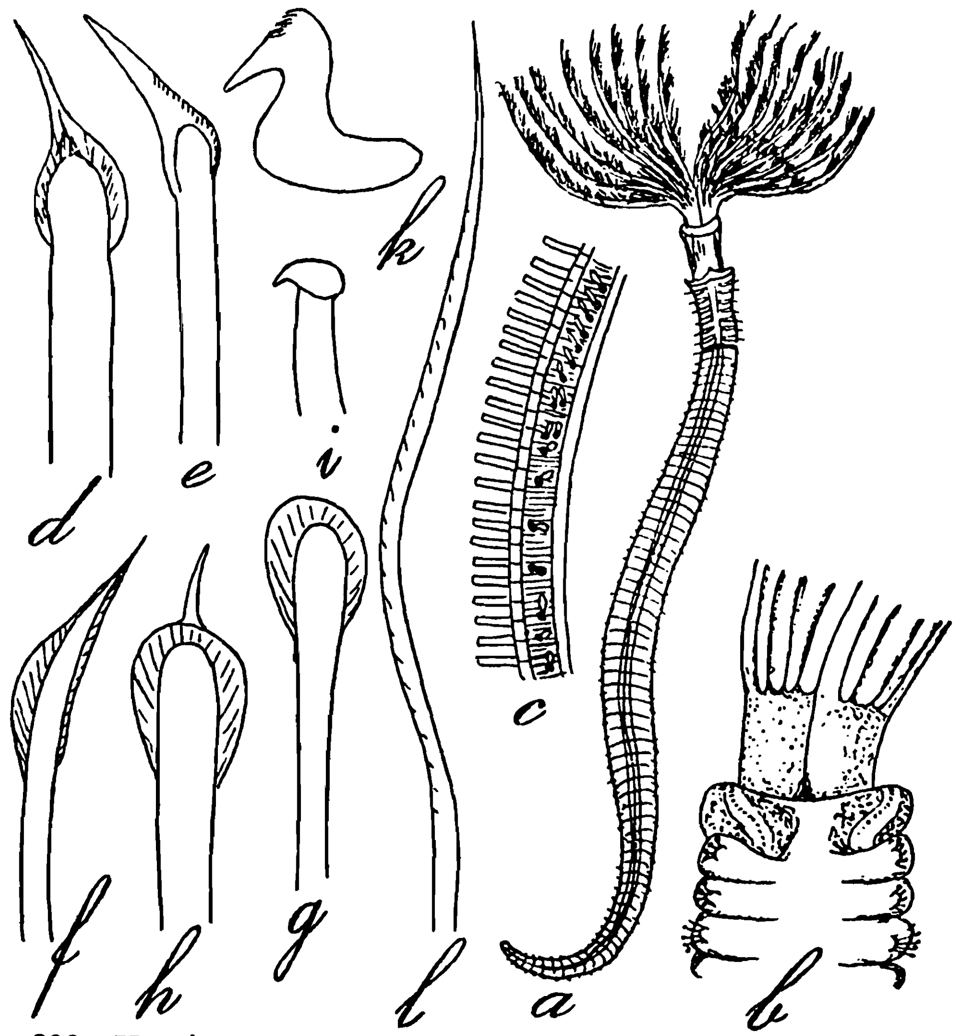

Fig. 236.—*Hypsicomus phaeotaenia* (Schmarda): *a*, (after Schmarda); *b*, anterior part, dorsal view; *c*, middle part of a gill-filament (after Gravier); *d*, *e*, bristles from the first segment, front and side view; *f*, thoracic winged seta ×230; *g*, thoracic palea ×230; *h*, abdominal palea ×230; *i*, pick-axe seta; *k*, thoracic hook ×230; *l*, abdominal capillary bristle ×400.

Genus POTAMILLA Malmgren.

Branchial lobes symmetrical. Gill-filaments with or without eyes, without dorsal stylodes. Setae of the first setigerous segment *in a tuft*. Dorsal thoracic setae of two kinds: capillary and paleae; ventral uncini and pickaxe-shaped setae. In the abdomen, dorsal avicular uncini and ventral winged setae. Tube horny.

Key to the species of Potamilla.

1. Gill-filaments without eyes ... 2
   Gill-filaments with eyes ... *ehlersi* Gravier, p. 449.

2. Abdominal setae narrow, with a very long and slender tip — *leptochaeta* Southern, p. 449.
   Abdominal setae spatulate, with unequal wings and a shorter tip — *ceylonica* Augener, p. 449.

431. Potamilla ehlersi Gravier. (Fig. 238, *g—i*)

Potamilla ehlersi, Gravier, 1908, p. 87, pl. VI, figs. 60—64: Fauvel, 1930a, p. 62; 1932, p. 239.
Potamilla oligophthalmos, Augener, 1914, p. 109.

A number of gill-filaments bearing one to 4—7 dorsal eyes set in a longitudinal row. Collar well developed, with four lobes. Straight, narrow winged, dorsal setae and paddle-shaped paleae with a slender tip. Abdominal setae with unequal wings and a very long and slender tip.

Length: 10—40 mm.

Occurrence: Gulf of Mannar, Krusadai Island; Koweit Harbour, Persian Gulf.

Distribution: Indochina, Malay Archipelago, Australia (?); India, Persian Gulf, Red Sea.

432. Potamilla leptochaeta Southern. (Fig. 238, *a—f*)

Potamilla leptochaeta, Southern, 1921, p. 651, pl. XXXI, fig. 28: Fauvel, 1932, p. 239; 1939, p. 26.

Thoracic segments few, 6—7. 8—11 gill-filaments destitute of eyes. Collar sloping backwards, deeply notched and bilobed ventrally. Thoracic and abdominal capillary setae with elongate narrow wings and *very long filiform tips*. Thoracic spatulate setae have pear-shaped blades with finely pointed tips. Pickaxe-shaped setae with *long slender tips*. Tube membranous, coated with mud and sand.

Length: 10—40 mm.

Occurrence: Chingrighatta near Calcutta; Vizagapatam. A brackish water species.

Distribution: Malay Archipelago; India.

433. Potamilla ceylonica Augener. (Fig. 237, *a—g*)

Potamilla ceylonica, Augener, 1926, p. 470: Fauvel, 1930a, p. 61, fig. 17.

Branchial fan with 7—10 gill-filaments ending in a long slender naked tip. They are without eye-spots. Collar very slanting, broadly gaping on the back and with two flattened, reflected, acute ventral flaps. Palps broad

and laciniate. Thoracic segments very numerous (15—23 or more) Dorsal thoracic setae of two kinds; (1) winged capillaries and (2) oboval oar-shaped paleae with a long and slender tip. Avicular uncini with a long manubrium,

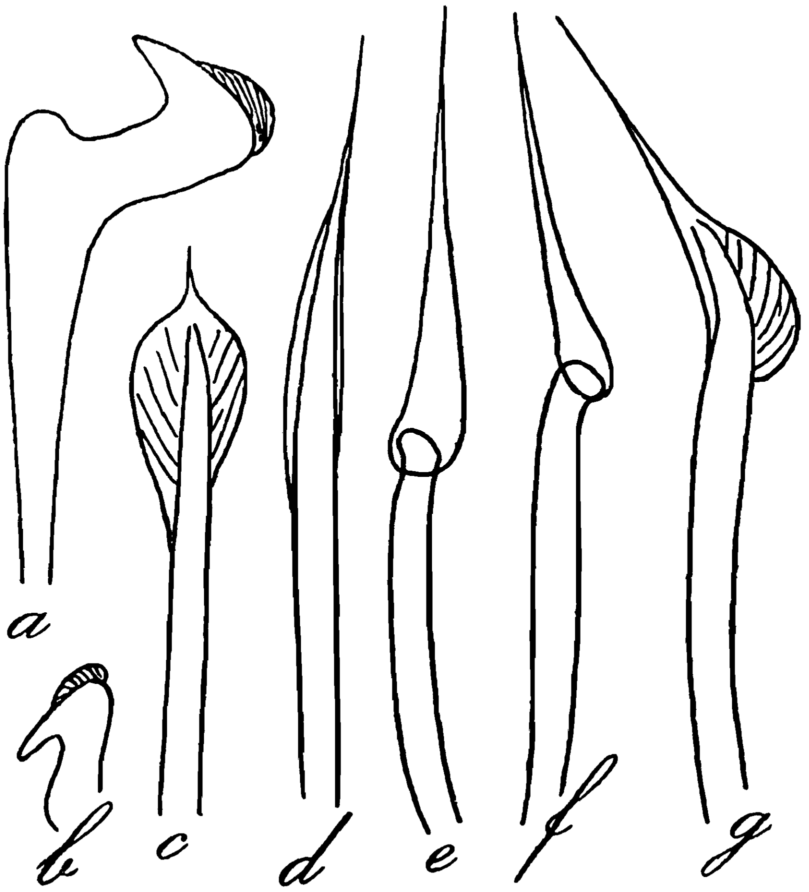

Fig. 237.—*Potamilla ceylonica* Augener: *a*, thoracic avicular uncinus ×400; *b*, abdominal uncinus ×400; *c*, thoracic oar-shaped palea ×400; *d*, thoracic capillary bristle ×400; *e*, *f*, pick-axe setae ×400; *g*, abdominal spatulate seta ×400.

and pickaxe-shaped setae, having a long fine point. Dorsal abdominal uncini avicular, and ventral spatulate setae with unequal wings and a long, slender tip.

Length: 30 mm.

Colour: Dark yellowish-grey.

Occurrence: Gulf of Mannar, Krusadai and Shingle Islands; Trincomalee.

Genus JASMINEIRA Langerhans.

Branchial lobes symmetrical, semi-circular, not spiral. Branchial filaments destitute of eyes and dorsal stylodes. *Otocysts present*. A collar. Thoracic segments with capillary setae of two kinds: (1) limbate, (2) spatulate. Avicular uncini. *Pickaxe-shaped setae absent*. Dorsal

abdominal uncini avicular; ventral setae winged, slender, often geniculate. Tube membranous, transitory.

434. **Jasmineira caducibranchiata** Willey. (Fig. 238, *m—n*)

Jasmineira caducibranchiata, Willey, 1905, p. 312, pl. VII, fig. 178—179.

Body tapering posteriorly. 8 thoracic segments with dorsal capillary setae and a single row of rostrate uncini with long manubrium. Dorsal abdominal uncini avicu-

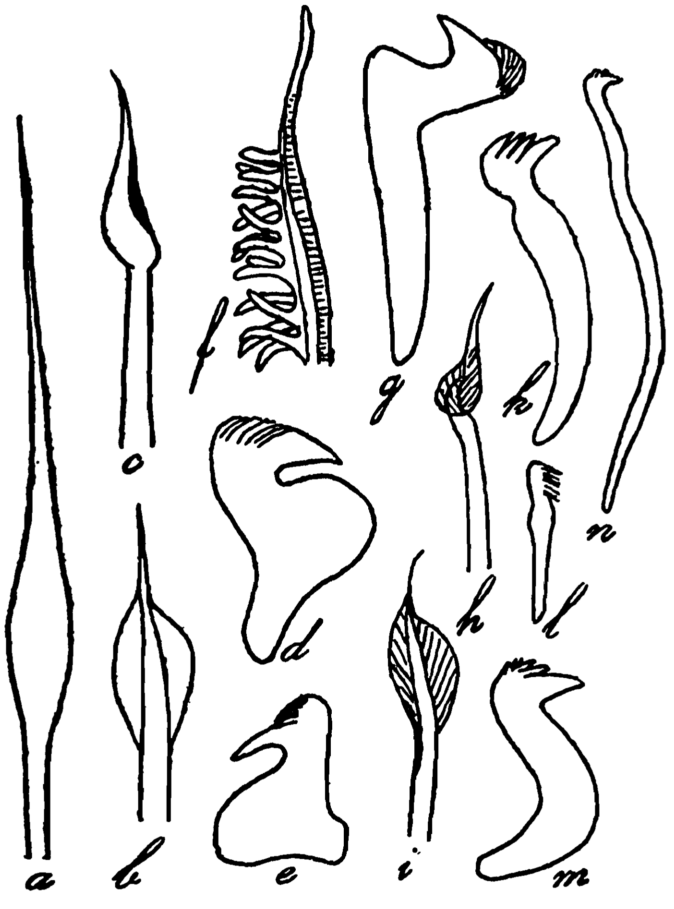

Fig. 238.—*Potamilla leptochaeta* Southern: *a*, short capillary seta from an anterior abdominal segment ×840; *b*, spatulate seta from the 6th thoracic segment ×840; *c*, pick-axe seta ×840; *d*, abdominal hook ×840; *e*, thoracic hook ×840; *f*, tip of a gill (after Southern). *P. ehlersi* Gravier: *g*, thoracic hook; *h*, pick-axe seta; *i*, thoracic palea (after Gravier). *Manayunkia spongicola* Southern: *k*, thoracic hook ×700; *l*, abdominal hook ×870 (after Southern). *Jasmineira caducibranchiata* Willey: *m*, abdominal hook; *n*, thoracic hook (after Willey).

lar. Collar rounded, slightly projecting forwards below, with a median notch dividing the two low rounded lobes and a shallow impression on each side of the notch. About a dozen radioles on each branchial filament. In-

side the gill-crown a pair of broad, pinkish laciniae, and below these a group of about 6 slender tentacular cirri attached to the lower ends of the gill-carriers.

Length: 22 mm. by 1.5 mm.

Occurrence: East side of Cheval Paar, Ceylon.

Genus MANAYUNKIA Leidy.

Haplobranchus Bourne.

Body very small. Branchial lobes symmetrical, branchial filaments simple, unbranched. Two palps. A collar. Ventral scutes absent. Dorsal thoracic setae. Uncini with a long stalk; pickaxe-shaped setae absent. Abdominal uncini elongated; ventral capillary setae.

435. **Manayunkia spongicola** Southern. (Fig. 238, *k, l*).

Manayunkia spongicola, Southern, 1921, p. 653, pl. XXXI, fig. 29.

Body cylindrical. 8 thoracic segments with dorsal capillary setae with short, flattened, blades and long slender tips. Ventral hooks stout, with three teeth above the main fang. In the three abdominal segments 1—2 capillary setae with very slight flattening of the blade and no wings; 9—11 dorsal hooks, rather small, with elongate shafts and numerous fine long teeth in several rows at one end. The gills consists of about 18—20 slender unbranched filaments on each side. Two clavate palps. Head conical in front, bearing two black eyes. A prominent collar, with an entire convex border ventrally. *No otocysts.* Pygidium spatulate, or pear-shaped, bearing two black eyes. Tube membranous, covered with ·flocculent mud.

Length: 1.5 to 3 mm.

Occurrence: Chilka Lake, brackish water. Tubes embedded in the sponge *Laxosuberites lacustris* Annandale, or amongst Algae.

Remarks: The presence of eyes on the pygidium and a more developed collar are the principal features differentiating this species from *M. aestuarina* Bourne.

Family SERPULIDAE Burmeister.

Body divided into two regions: (1) thoracic, consisting of a few segments bearing dorsal and capillary setae and ventral uncinigerous tori; (2) abdominal, which is much longer, and has dorsal uncinigerous tori and ven-

tral capillary setae. Ventral glandular shields divided by a longitudinal shallow groove. First segment with a more or less developed collar. *A thoracic membrane.* Gills forming a funnel surrounding the mouth and composed of two semi-circular or spiral lobes bearing a number of filaments or radioles with two rows of barbules. *Usually an operculum.* Tubes calcareous.

Key to the genera of SERPULIDAE.

1. Body symmetrical	2
Body asymmetrical. Calcareous spirally coiled tube	*Spirorbis* Daudin, p. 477.
2. Opercular stalk smooth or winged	3
Operculum absent, or 1—2 opercula with a stalk, bearing barbules	13
3. First thoracic segment with only dorsal (collar) setae	4
First thoracic segment without either dorsal (collar) setae or uncini	*Ditrupa* Berkeley, p. 470.
4. Collar setae bayonet-shaped, with two conical processes at the base	5
Collar setae without basal conical procesess	6
5. Operculum simple, funnel shaped	*Serpula* Linnaeus, p. 454.
Operculum compound, with a central crown of spines	*Hydroides* Gunnerus, p. 456.
6. Abdominal setae geniculate	7
Abdominal setae trumpet-shaped; opercular stalk winged	10
7. Collar setae bayonet-shaped, or deeply serrated	8
Collar setae simple blades	*Vermiliopsis* Saint-Joseph, p. 465.
8. Collar setae serrated	9
Collar setae bayonet-shaped, covered with fine hair-like processes	*Omphalopomopsis* Saint-Joseph, p. 467.
9. Operculum fig-shaped, smooth	*Ficopomatus* Southern, p. 473.

Operculum covered with rows of horny spines	*Mercierella* Fauvel, p. 474.
10. Collar setae very small and fine	11
Collar setae bayonet-shaped and covered with fine hair-like processes	12
11. Operculum flat, with winged pedicle	*Pomatoleios* Pixell, p. 461.
Operculum conical. Pedicle winged and fringed	*Pomatoceros* Philippi, p. 469.
12. Operculum with several horny discs, or a spinulose cone	*Pomatostegus* Schmarda, p. 464.
Operculum bearing generally a group of branched spines	*Spirobranchus* Blainville, p. 462.
13. Tubes very slender, filiform, colonial. Collar setae serrated	14
Tubes large, not colonial. Collar setae winged	15
14. Operculum spoon-like at the end of a branchial filament	*Filograna* Oken.
Operculum absent	*Salmacina* Claparède, p. 476.
15. Operculum globular	*Apomatus* Philippi.
No operculum	*Protula* Risso, p. 471.

Genus SERPULA Linnaeus.

Collar setae bayonet-shaped, with two conical processes at the base of the blade. Operculum funnel-shaped, with numerous radii ending in serrations along the margin. Uncini with only few stout teeth. Thoracic setae winged, abdominal setae trumpet-shaped.

436. Serpula vermicularis Linnaeus. (Fig. 239, *a—q*).

Serpula vermicularis, Pixell, 1913, p. 71: Fauvel, 1927a, p. 351, fig. 120 (Synonymy); 1932, p. 241.

Collar setae with two large, conical, blunt processes at the base. Uncini with 4—7 teeth, the lower one more stout and blunt. Collar trilobed. Operculum concave, with numerous radii, symmetrical. Tube variable, cylin-

drical, wrinkled, with 5—7 longitudinal ridges, smooth or serrated or echinulate, rather bell-shaped at the mouth; more or less crooked and generally of a red or pink colour, more rarely white.

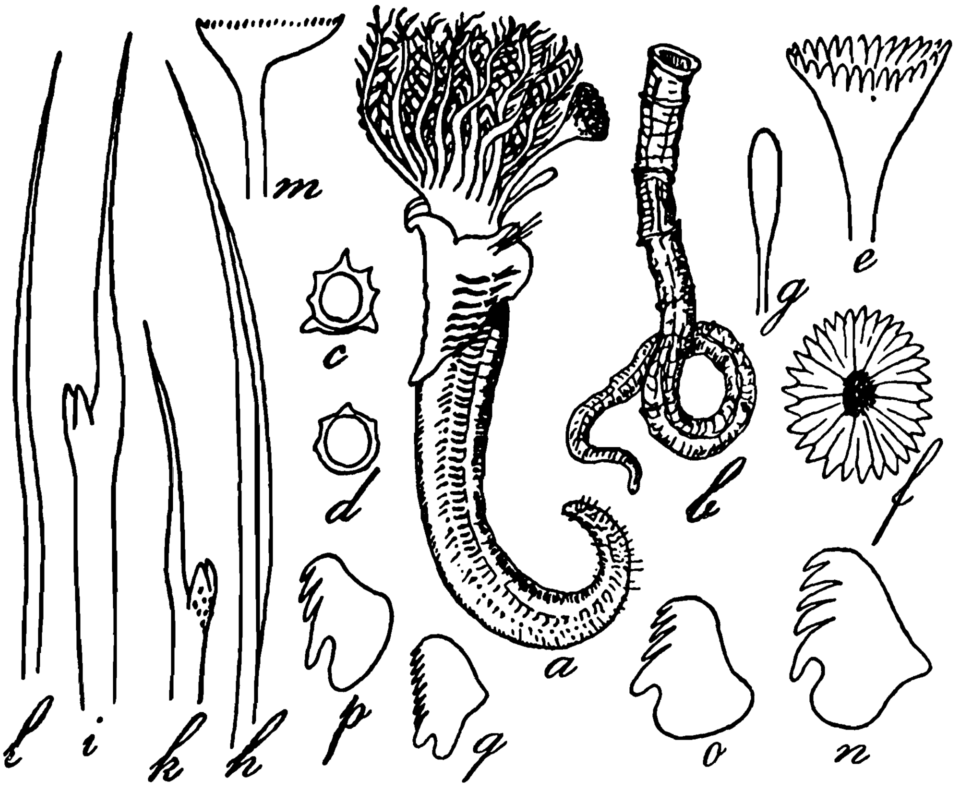

Fig. 239.—*Serpula vermicularis* Linn. *a*, side view ×2.5; *b*, tube, natural size; *c*, *d*, section of the tube; *e*, *f*, operculum; *g*, false operculum; *h*, thoracic bristle ×105; *i*, bristle from the first setigerous segment (collar bristle) ×105; *k*, young collar bristle with denticles at the base of the prongs ×105; *l*, capillary seta from the collar ×105; *m*, abdominal bristle ×350; *n*, *o*, thoracic uncini ×350; *p*, abdominal uncinus ×350; *q*, another form of uncinus ×350.

Length: 50—70 mm. by 5—6 mm.

Colour: in life very variable. Operculum with radiating red and white streaks.

Occurrence: Moscos Islands, Burma; Orissa Coast, Madras Coast; Persian Gulf.

Distribution: Magellan; Indian Ocean, Kerguelen, Persian Gulf, Red Sea; Atlantic Ocean, Mediterranean Sea.

var. **granulosa** Marenzeller.

Serpula granulosa, Marenzeller, 1884, p. 215: Willey, 1905, p. 316, pl. VII, figs. 186, 186A.

"Operculum shallowly concave, with 46—52 rays which project as denticulations at the margin. The

grooves which separate the rays do not all reach to the centre of the disc; they are superficial indications of dissepiments which project vertically with a free inner border into the substance of the operculum. Minute tubercles are sparsely distributed on the concave opercular disc. Tube round, subcristate to cristate." (Willey)

Occurrence: South-west Cheval Paar, Ceylon.

Distribution: Japan; Ceylon.

var. **watsoni** Willey.

Serpula watsoni, Willey, 1905, p. 317, pl. VII, fig. 187; pl. VIII, fig. 6.

Characterised by the great length of the ampulla of the operculum, which is about twice the length of that portion of the style which rises above the collar. The collar is entire below, divided on each side by a lateral notch.

Occurrence: Trincomalee.

Genus **HYDROIDES** Gunnerus.

Eupomatus Philippi.

Collar setae bayonet-shaped, with two conical processes at the base of the blade. Uncini with a few coarse teeth, the lower one larger than the others. Thoracic setae winged, abdominal setae trumpet-shaped. *Operculum funnel-shaped with a crown of horny spines arising from the centre.*

Key to the species of Hydroides.

1. Central crown of the operculum with broad laceolate valves	*perezi* Fauvel, p. 457.
Central crown of the operculum with spines	2
2. Opercular spines with lateral processes	3
Opercular spines without lateral spines (Subgen. *Eupomatus*)	*exaltatus* (Marenzeller). p. 461.
3. All opercular spines alike	4
Opercular setae of two kinds	6
4. More than one pair of lateral processes. Tips of spines sharp	*norvegica* Gunnerus, p. 458.
One pair of lateral processes only	5

5. Processes not terminal, tips of the spines sharp	*homoceros* Pixell, p. 458.
Tips of the spines half-moon-shaped	*lunulifera* (Claparède), p. 458.
6. One spine only *without* lateral processes, large and curved	*heteroceros* (Grube), p. 459.
Only one spine, *with* lateral processes	7
7. The largest spine a compressed, oval lamina ..	*albiceps* (Ehrenberg), p. 460.
The largest spine a stout recurved hook	8
8. Central opercular crown symmetrical	*minax* (Grube), p. 460.
Central opercular crown asymmetrical ..	*monoceros* Gravier, p. 460.

437 Hydroides perezi Fauvel. (Fig. 240, *a—j*)

Hydroides perezi, Fauvel, 1918, p. 342, fig. 2; 1919, p. 452, fig. XII.

Operculum horny, gemmiform. Radii of the lower funnel with a pointed tip curved outwards. Central

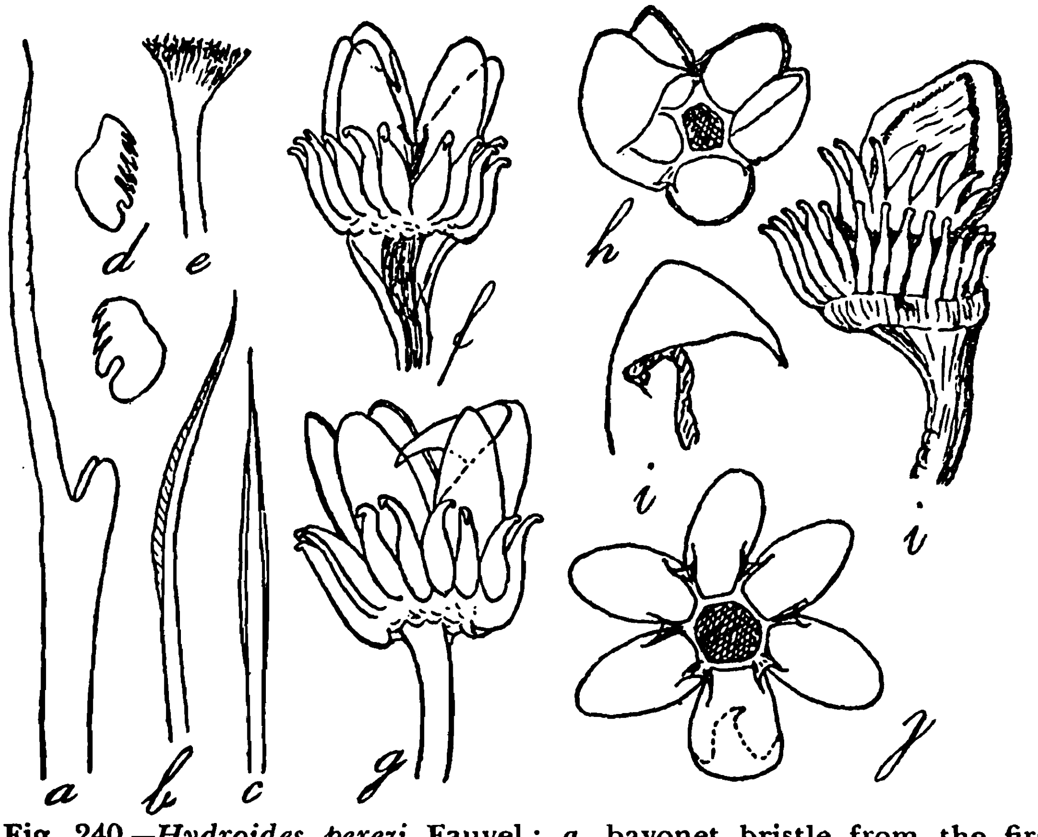

Fig. 240.—*Hydroides perezi* Fauvel: *a*, bayonet bristle from the first setigerous segment ×350; *b*, *c*, capillary thoracic bristles ×350; *d*, thoracic and abdominal hooks ×500; *e*, abdominal bristle ×500; *f*, *g*, operculum ×60; *h*, upper row of half opened operculum seen from above ×60; *i*, large leaf with inner curved hook ×60; *j*, upper opercular row flattened, seen from underneath ×60; *H. exaltatus* var. *vesiculous* Fauvel: *i* (on the right), operculum.

crown with 5—6 oval, concave valves, with a raised smooth border. One, slightly larger, ends in a long recurved hook turned inwards. The valves are connected at half-length by a membrane forming pockets. Tube whitish, encrusting, rough, more or less spiral or sinuous.

Length: 5—6 mm. by 0.5 mm.

Occurrence: Persian Gulf. Dredged on *Avicula's* shells.

438. **Hydroides homoceros** Pixell. (Fig. 241, *a*).

Hydroides homoceros, Pixell, 1913, p. 74, pl. VIII, fig. 1.

" The opercular funnel has about 17 teeth with lateral processes, and the central crown consists of 7 *slender spines*, each having a pair of lateral hooks about half-way and a median basal internal one. Tube slightly ribbed, not much bent, mouth simple." (Pixell)

Length: 13—24 mm. by 2 mm.

Occurrence: Maldive Archipelago.

439. **Hydroides norvegica** (Gunnerus). (Fig. 241, *i*)

Hydroides norvegica, Pixell, 1913, p. 74: Fauvel, 1927a, p. 356, fig. 122, *i—o*; 1932, p. 242.

Hydroides multispinosa, Marenzeller, 1884, p. 216, pl. IV, fig. 2: Augener, 1914, p. 139.

Eupomatus elegans, Haswell, 1883b, p. 633, pl. XII, fig. 1.

Radii of the operculum forming rounded lobes on the edge of the funnel, spines of the central crown equal, with several sharp lateral processes. Tubes white, cylindrical, faintly wrinkled and more or less erect or spirally coiled.

Length: 15—30 mm. by 1—2 mm.

Occurrence: Madras.

Distribution: Indian Ocean, Persian Gulf, Red Sea; Atlantic Ocean, Mediterranean Sea.

440. **Hydroides lunulifera** (Claparède). (Fig. 241, *h*).

Hydroides lunulifera, Fauvel, 1927a, p. 358, fig. 122, *p—s*; 1932, p. 242: Potts, 1928, p. 701.

Eupomatus lunulifera, Clapartède, 1868, p. 441, pl. XXXI, fig. 3.

Radii of the operculum forming sharp lobes on the edge of the funnel, spines of the central crown equal with flattened half-moon or anchor-shaped tips. Tubes slender, white, cylindrical, more or less coiled.

Length: 12–30 mm. by 1–3 mm.

Occurrence: Madras.

Distribution: Madras; Suez Canal; Mediterranean Sea.

441. Hydroides heteroceros (Grube). (Fig. 241, *c*).

Hydroides heteroceros, Fauvel, 1911, p. 428: Pixell, 1913, p. 75, pl. VIII, fig. 2.

Hydroides uncinata (*non* Philippi), Gravier, 1908, p. 114, pl. VIII, 286–287.

Eupomatus heteroceros, Grube, 1868, p. 639, pl. VII, fig. 8: Willey, 1905, p. 313.

Radii of the operculum with a terminal knob. Seven spines in the central crown, bent at the tip and with

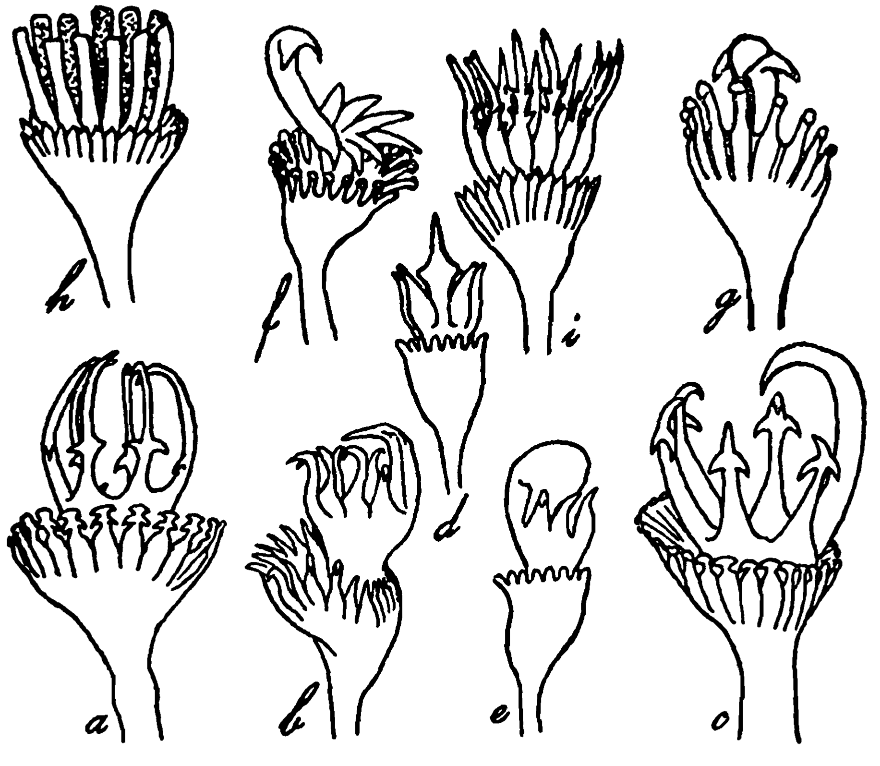

Fig. 241.—*Hydroides* operculum: *a, H. homoceros* (Pixell) ×24; *b, H. exaltatus* (Marenzeller) ×11; *c, H. heteroceros* (Grube) ×12 (after Pixell); *d, e, H. albiceps* (Ehrenberg), dorsal and side view (after Willey); *f, H. minax* (Grube) ×18 (after Grube): *g, H. monoceros* Gravier (after Gravier); *h, H. lunulifera* (Claparède) ×21; *i, H, norvegica* (Gunnerus) ×21.

lateral hooks, the seventh is much larger, bent, alpenstock-shaped and destitute of lateral processes. Tubes thick, flattened on side of attachment, often coiled, marked by faint longitudinal lines, aperture circular.

Length: about 40 mm. by 4 mm.

Colour: Body dull yellowish; gills dark crimson at the base, light yellow distally.

Occurrence: Ceylon; Koweit Harbour.

Distribution: India, Persian Gulf, Red Sea, Zanzibar,

442. **Hydroides monoceros** Gravier. (Fig. 241, *g*).

Hydroides monoceros, Gravier, 1908, p. 115, pl. VIII, fig. 288: Pixell, 1913, p. 76: Fauvel, 1923, p. 48; 1930a, p. 63.

The lower funnel of the operculm is *oval* and slanting, has teeth with enlarged extremities. The asymmetrical central crown has 6 very small spines and bears a very large one with a lateral triangular hook on each side and a strong curved terminal tip. Tubes thick, more or less curved, with longitudinal and transverse ridges.

Length: about 15 mm.

Occurrence: Rameswaran, Gulf of Mannar.

Distribution: Gambier Islands; India, Red Sea, Zanzibar.

Remarks: Closely allied to *H. minax* (Grube).

443. **Hydroides minax** (Grube) (Fig. 241, *f*)

Hydroides minax, Fauvel, 1939, p. 361.
Serpula minax, Grube, 1878, p. 269, pl. XX, fig. 5.
Eupomatus minax, Willey, 1905, p. 314.

Radii of the inferior part of the operculum numerous, with a small terminal knob. Central crown *symmetrical*, with 6 short pointed spines bent outwards, the 7th, much larger, is erect, with a stout recurved hook, bent inwards and with two lateral accessory hooks. Tube round, showing coarse growth rings.

Occurrence: Ceylon.

Distribution: Philippine Islands, Annam; Ceylon.

444. **Hydroides albiceps** (Ehrenberg) (Fig. 241, *d, e*).

Eupomatus albiceps, Grube, 1969, p. 520: Willey, 1905, p. 312, pl. VII, figs. 180—181.

Marginal teeth of the opercular funnel blunt. Central crown with 7—8 nearly erect, slightly curved virgulae and a laterally compressed, ovate, lamina dorsalis, the latter being a direct continuation of the columella and bearing a pair of broad dorso-lateral hamuli. Thoracic uncini with about 7—9 teeth. Tube quadrilateral, winding round a tube of *Chaetopterus ramosus*.

Length: 7 mm.

Occurrence: Ceylon, Cheval Paar.

445. **Hydroides exaltatus** (Marenzeller) (Fig. 241, *b*)

Eupomatus exaltatus, Marenzeller, 1884, p. 217, pl. IV, fig. 3: Willey, 1905, p. 312, pl. VII, fig. 182; Pixell, 1913, p. 77.

"The inner funnel of the operculum is raised on a short column and has 8—9 strong hook-like spines, without secondary processes, except at the base; the dorsal one is twice as large as the others and bends suddenly at a right angle over the top of them." (Pixell)

Length: about 20 mm.

Colour: Body dull green.

Occurrence: Ceylon.

Distribution: Japan; India, Red Sea, Zanzibar.

var. **vesiculosus** Fauvel. (Fig. 240, *i*).

Hydroides exaltatus, var. *vesiculosus*, Fauvel, 1919, p. 342, fig. 1; 1923, p. 40; 1939, p. 30: Monro, 1937, p. 316.

A large hollow vesicle takes the place of the great unpaired hook. It is a connecting link between *H. exaltatus* (Marenzeller) and *H. albiceps* (Ehrenberg)

Occurrence: Gambier Islands, Java; Zanzibar.

Genus POMATOLEIOS Pixell.

"Collar setae and eye-spots absent. Uncini with fairly numerous teeth, the most anterior being larger and gouged underneath. Abdominal setae trumpet-shaped with one side produced into a long spine. Operculum flat with winged pedicle. Tube with a flap over the entrance." (Pixell)

446. **Pomatoleios crosslandi** Pixell.

Pomatoleios crosslandi, Pixell, 1913, p. 85, pl. IX, fig. 10.

"All thoracic setae simple striated blades. Uncini with 10 or 11 teeth in both thorax and abdomen. Branchiae with very high inter-branchial membrane and long bare terminal filaments." (Pixell)

Remarks: The operculum of the Madras specimen is tipped with a hollow calcareous cup destitute of spines. The pedicle has thick lateral wings with straight edges.

Neither Pixell nor I were able to detect any collar setae. The flap of the tube, mentioned by Crossland, has not been observed again.

Length: 4—14 mm.

Occurrence: Madras.

Distribution: Madras; Red Sea.

Remarks: Differs only from *Pomatoceros caeruleus* in the absence of collar setae, flat operculum and flap of the tube.

Genus SPIROBRANCHUS Blainville.

" Operculum with a calcareous plate generally bearing a group of branched spines. Pedicle with broad lateral wings. Collar setae bayonet-shaped and covered with fine hair-like processes. Abdominal setae trumpet-shaped, the edges compressed and toothed and produced at one place into a long fine point. Uncini with numerous teeth, the lower one larger and hollowed out underneath like a gouge. Uncinigerous tori of the two sides widely separated ventrally in front, and gradually approaching one another towards the end of the thorax, thus leaving a triangular depression" (Pixell).

Key to the species of Spirobranchus.

1. Operculum without processes	*maldivensis* Pixell, p. 464.
Operculum with processes ..	2
2. Opercular plate with two antler-like processes. Pedicle winged	*giganteus* (Pallas), p. 462.
Operculum with several much branched processes. Pedicle wing-less	*jousseaumei* (Gravier), p. 464.

447. Spirobranchus giganteus (Pallas). (Fig. 242 *a—g*).

Spirobranchus giganteus, Pixell, 1913, p. 80; Fauvel, 1923b, p. 52; 1932, p. 244; Pruvot, 1930, p. 88.

Spirobranchus multicornis Grube, Fauvel, 1911, p. 430.

Spirobranchus tricornigerus Grube, Willey, 1905, p. 318.

Spirobranchus cervicornis, Willey, 1905, p. 317, pl. VII, figs. 188—192.

Spirobranchus tetraceros, Johansoon, 1918, p. 7.

Spirobranchus semperi, Augener, 1914, p. 148: Willey, 1905, p. 318.

Cymospira gaymardi, Quatrefages, 1865, p. 539, pl. 16 bis fig. 13.

Pomatoceropsis coutierei, Gravier, 1908, p. 125, pl. VIII, figs. 294, 299.

Opercular plate with two antler-like processes, which sometimes, however, branch close to their base. Abdomen about 11 times as long as its greatest breadth with numerous (200—300) segments. (Pixell)

There is a considerable range of variation to be found in the operculum whose antlers may be more or less developed and branched; but too often they are broken. The tube is pink, but generally more or less imbedded in the corals.

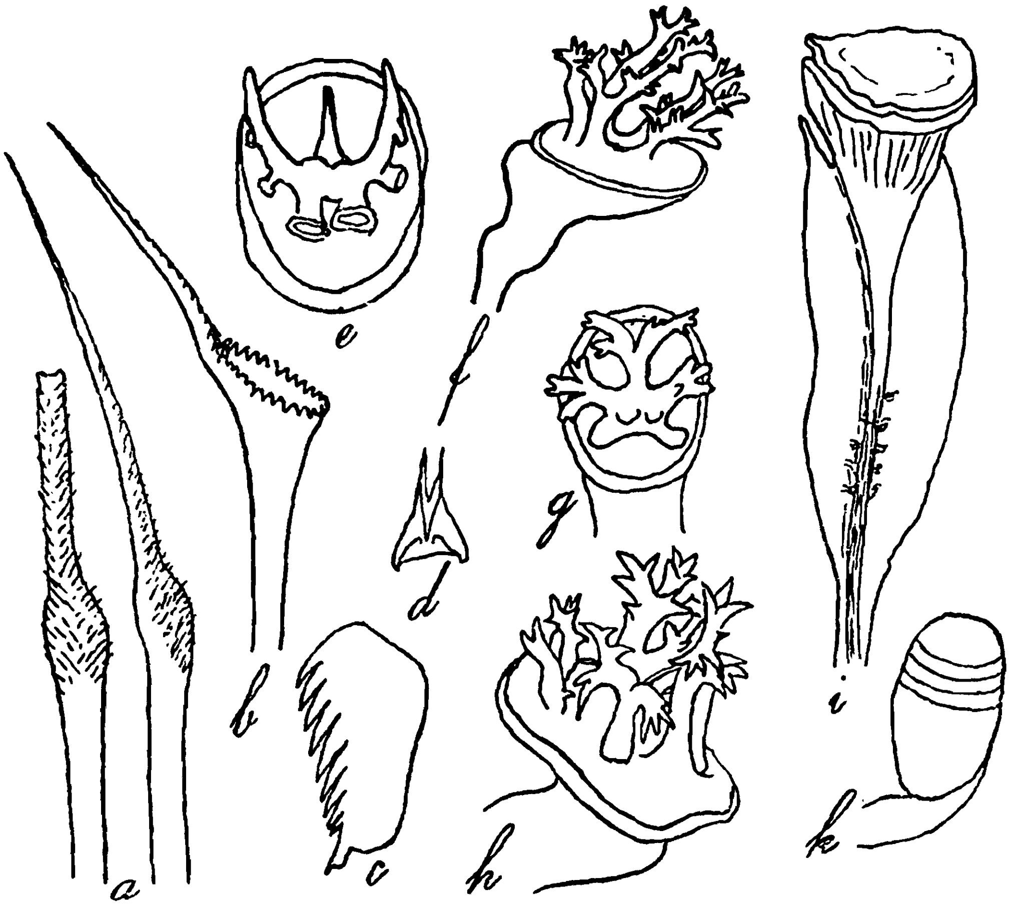

Fig. 242.—*Spirobranchus giganteus* (Pallas): a, bristles from the first setigerous segment ×240; *b*, ventral abdominal trumpet-shaped bristle ×240; *c*, thoracic hook ×240; *d*, lower tooth of a thoracic hook ×395; *e*, *f*, *g*, several kinds of operculum (after Grube and Quatrefages). *Spir. jousseaumei* (Gravier); *h*, operculum (after Gravier); *Spir. maldivensis* Pixell: *i*, operculum (after Pixell). *Vermiliopsis glandigerus* Gravier: *k*, operculum (after Gravier).

Length: 100–120 mm. by 6–7 mm.

Colour: Body yellow, with a deep blue thoracic membrane. The gills are blue at the base and with white, blue and pink stripes.

Occurrence: Nankauri Harbour, Nicobar Islands; Great Coco Island; Ceylon.

Distribution: Intertropical areas of Pacific, Indian and Atlantic Oceans, especially in coral reefs.

448. Spirobranchus jousseaumei (Gravier) (Fig. 242, *h*).

Spirobranchus jousseaumei, Potts, 1928, p. 701: Fauvel, 1932, p. 244.

Pomatoceropsis jousseaumei, Gravier, 1908, p. 130, pl. VIII, figs. 292–293.

Opercular plate with several distinct, much branched processes. Pedicle winged. Tube with several wavy ridges.

Length: 30 mm.

Colour: Gills of a deep violet-blue colour.

Occurrence: Palan Biddang.

Distribution: Palan Biddang; Red Sea, Suez Canal.

449. Spirobranchus maldivensis Pixell. (Fig. 242, *i*)

Spirobranchus maldivensis, Pixell, 1913, p. 84, pl. IX, fig. 9: Fauvel, 1932, p. 245: Monro, 1937, p. 318.

" Operculum a thick calcareous plate, without processes, supported by a tall pedicle with thin lateral wings. Collar setae with a short, wide, finely striated, fin-like process at the base of the narrow anterior blade. Branchiae about 32 pairs with numerous long pinnae except at their distal ends, which are bare and filamentous. Thoracic uncini have about 15 teeth in addition to the large gouge-shaped one, and the abdominal 13. Abdominal setae narrow compressed trumpets, with one side produced into a long process." (Pixell) Tube with one or three coarsely serrated ridges.

Length: 20—30 mm.

Occurrence: Off Cape Negrais, Burma, 40 fms.: Gulf of Oman.

Distribution: Burma; Maldive Archipelago, Arabian Coast, Gulf of Oman.

Genus POMATOSTEGUS Schmarda.

Collar setae bayonet-shaped and covered with hair-like processes. Operculum with a slanting calcareous plate or several horny discs united by a central vertical column. Opercular pedicle with lateral wings. Abdominal setae trumpet-shaped or *Salmacina*-like.

Key to the species of Pomatostegus.

Operculum with a slanting plate. Abdominal setae trumpet-shaped ..	*polytrema* Philippi, p. 465.
Operculum with horny discs. Abdominal setae *Solmacina*-like	*stellatus* Abildgaard, p. 465.

450. Pomatostegus stellatus Abildgaard. (Fig. 248, *a*)

Pomatostegus stellatus, Gravier, 1908, p. 133: Pixell, 1913, p. 79: Johansson, 1918, p. 10, fig. 10—11: Fauvel, 1932, p. 246.

Pomatostegus actinoceros, Willey, 1905, p. 314, pl. VIII, figs. 34: Augener, 1914, p. 152.

Operculum with several horny denticulated discs piled up very close and strung on a hollow pillar with rows of star-like diverging spines and a circle of spines under each plate. Pedicle flat, with broad smooth wings. A high collar. Abdominal setae sickle-shaped (*Salmacina* setae).

Occurrence: Malacca Straits; Andaman Islands, Gulf of Mannar, Krusadai, Pamban, Ceylon, West Coast of India.

Distribution: Pacific, Indian and Atlantic Oceans.

451. Pomatostegus polytrema Philippi. (Fig. 245, *l—q*)

Pomatostegus polytrema, Rioja, 1917, p. 87, fig. 25: Fauvel, 1927a.

Operculum a membranous vesicle shaped as an inverted cone capped with a calcareous plate which may be level, convex or bluntly conical, smooth, or bearing 1, 2 or 3, more or less developed prongs very variable in shape. Abdominal setae trumpet-shaped. Tube with characteristic alveoles and perforations.

Distribution: Atlantic Ocean, Mediterranean Sea.

var. **indica** Fauvel. (Fig. 206, *h, i*).

Pomatostegus polytrema var. *indica*, Fauvel, 1930a, p. 64, fig. 15, *h—i*.

Lower bladder of the operculum capped with a rigid cone, somewhat arched and bearing a number of small spines on its concave side.

Occurrence: Gulf of Mannar, Krusadai Island.

Genus VERMILIOPSIS Saint-Joseph.

Vermilia pro parte.

" Collar setae simple blades. Uncini with fairly numerous teeth, the most anterior are larger and blunter than the rest. Abdominal setae geniculate. Some thoracic setae are bladed sickles (setae of *Apomatus*), thus differing from the genus *Vermilia* with ordinary bladed setae only. Operculum with a horny somewhat cylindrical or conical cap" (Pixell)

Key to the species of Vermiliopsis.

1. Gills swollen at the tip — *pygidialis* (Willey), p. 466.
   Gills not swollen at the tip — 2
2. Operculum without partitions — *acanthophora* Augener, p. 467.
   Operculum with partitions — *glandigerus* Gravier, p. 467.

452. **Vermiliopsis pygidialis** (Willey). (Fig. 243, *a–b*)

Vermiliopsis pygidialis, Pixell, 1913, p. 86, pl. 9, fig. 11.
Vermilia pygidialis, Willey, 1905, p. 318, pl. VII, figs. 194–196.

Branchiae with ocelli and elongated, often with much swollen ends free from pinnae. Operculum with a conical (sometimes truncated) chitinous cap. Uncini with

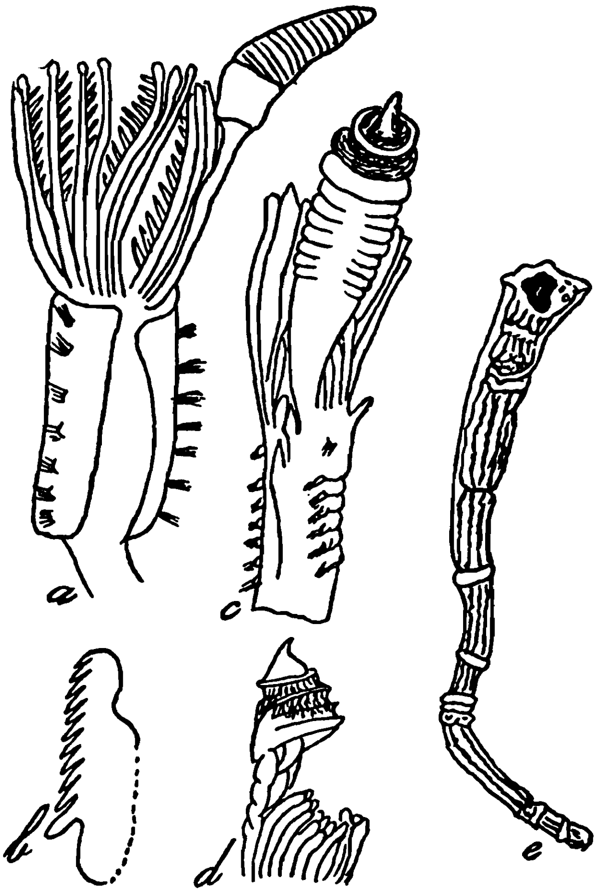

Fig. 243.—*Vermiliopsis pygidialis* (Willey): *a,* anterior region, dorsal view, enlarged; *b,* thoracic hook (after Willey). *V. acanthophora* Augener: *c,* anterior part, dorsal view ×14; *d,* operculum ×23; *e,* tube, aperture somewhat damaged ×2 (after Augener).

13—14 teeth. Terminal dorsal gland generally present as an oval purplish-crimson cushion, with long hair-like setae on the obtuse last segments. Tube coiled, with 4—5 low longitudinal keels.

Length: about 20 mm.

Colour: Gills tipped with pink.

Occurrence: Ceylon.

Distribution: India, Maldive Archipelago, Suez, Zanzibar.

453. **Vermiliopsis acanthophora** Augener. (Fig. 243, *c*–*e*)

Vermiliopsis acanthophora, Augener, 1914, p. 155, pl. I, figs. 21–24; Fauvel, 1930a, p. 63; Monro, 1937, p. 318.

The flat, smooth, wingless pedicle of the operculum bears a white hemisphere capped with a yellow cone, *without chitinous partitions*, ending in a horn-like hook. The thoracic segments bear *Apomatus* setae. Tube with traces of successive peristomes.

Length: 20 mm.

Occurrence: Gulf of Mannar, Krusadai Island.

Distribution: Galapagos Islands, Australia, Gambier Island; India, Gulf of Oman, Arabian Coast.

454. **Vermiliopsis glandigerus** Gravier. (Fig. 242, *k*)

Vermiliopsis glandigerus, Gravier, 1908, p. 121, pl. VIII, figs. 290–291.

Vermiliopsis glandigera, Augener, 1918, p. 602: Fauvel, 1930a, p. 63: Monro, 1937, p. 318.

The wrinkled pedicle of the operculum bears a white opaque hemisphere, with a yellow horny cone, short or elongate, divided by 3–4 partitions and sometimes slightly hollowed at the tip in a small cup. Thoracic segments with *Apomatus* setae. Tube wrinkled, with 4–5 longitudinal keels and more or less conspicuous transverse peristomial ridges.

Length: 15–20 mm.

Occurrence: Gulf of Mannar, Krusadai and Shingle Islands, Rameswaram.

Distribution: Panama; India, Arabian Sea, Red Sea, Madagascar; Atlantic Ocean, West Africa, Gulf of Guinea.

Genus OMPHALOPOMOPSIS Saint-Joseph.

Operculum chitinous or horny, concave or funnel-shaped. Thoracic membrane very short. Setae of the first segment (collar setae) acicular, or geniculate. Thoracic setae winged capillaries and *Apomatus* setae. Abdominal setae geniculate and long slender capillaries. Uncini pectiniform, with lower tooth larger but not gouge-like.

455. **Omphalopomopsis langerhansi** (Marenzeller). (Fig. 244, *a—h*)

Omphalopomopsis langerhansi, Fauvel, 1930a, p. 65, fig. 18.
Omphalopoma langerhansi, Marenzeller, 1884, p. 219, pl. IV, fig. 6.

Operculum with a yellow rounded plate slightly depressed, saucer-like, with a single stout spike arising nearly in the centre. It is borne on a huge thick pedicle, nearly as broad as the terminal plate, bulging in the middle and with edges thinned into lateral smooth wings, without any processes. Gills short, thick, crowded into dense semi-circular clusters, in-rolled, but not spirally

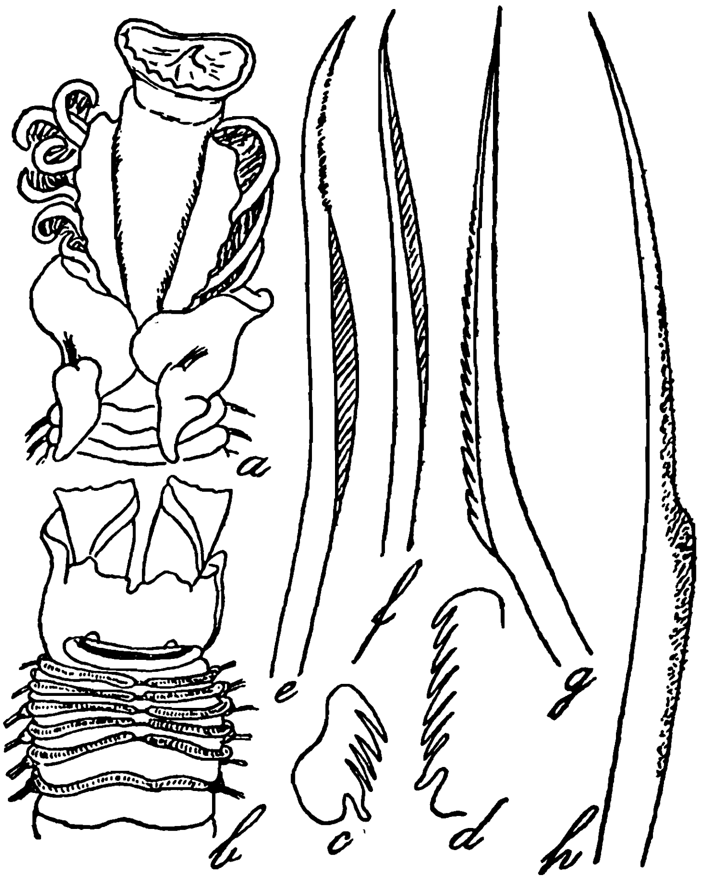

Fig. 244.—*Omphalopomopsis langerhansi* (Marenzeller): *a,* anterior part and operculum, dorsal view ×4; *b,* anterior region, ventral view ×4; *c,* abdominal uncinus ×400; *d,* thoracic uncinus ×400; *e, apomatus* seta from the last thoracic segment ×150; *f,* thoracic winged capillary bristle ×150; *g,* abdominal geniculate bristle ×400; *h,* collar seta from the 1st segment ×300.

coiled. The collar, widely open dorsally, has an irregular serrated edge but no distinct flaps. Thoracic membrane very short. 7 thoracic segments. Collar setae minutely spinose. Other thoracic setae winged and accompanied by *Apomatus* setae in the last thoracic segments. Thoracic tori very long, nearly meeting in the middle

of the ventral side. Abdominal setae somewhat geniculate and serrated. Abdominal tori very long, with pectiniform uncini whose lower tooth is larger, but not gouge-like.

Length: 35 mm. by 5 mm.

Colour: pedicle of the operculum variegated with dark spots. Gills tinged with violet-brown.

Occurrence: Gulf of Mannar, Rameswaram.

Distribution: Japan; India.

Genus POMATOCEROS Philippi.

Operculum with a calcareous plate very variable, flat or conical, smooth or spinose, borne on a *winged pedicle.*

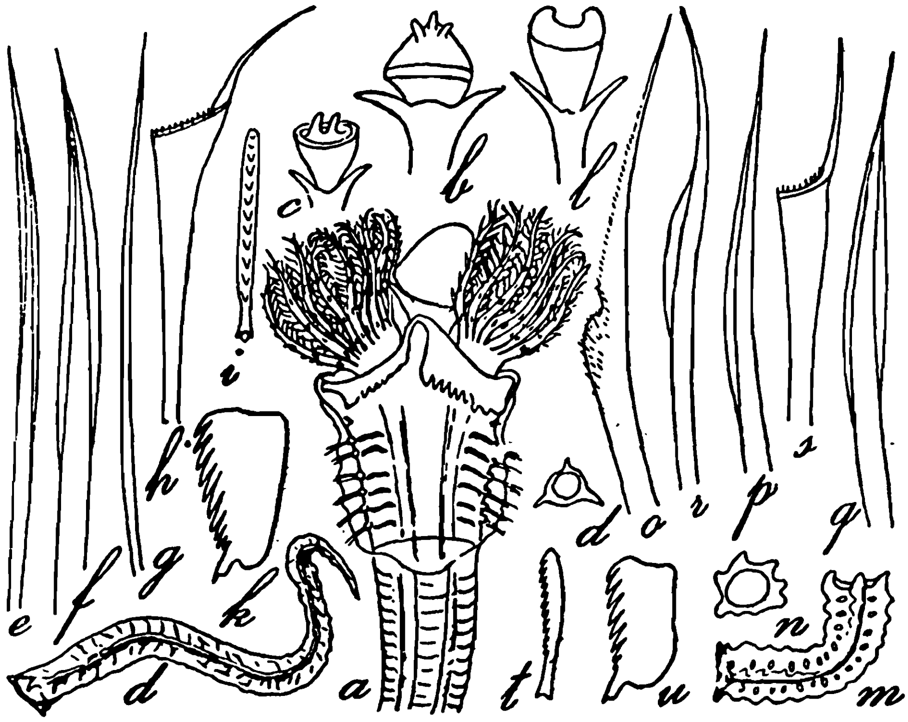

Fig. 245.—*Pomatoceros triqueter* Linn: *a,* anterior part, ventral view, enlarged; *b, c,* several shapes of operculum; *d,* tube, natural size and section; *e,* collar bristle ×235; *f,* thoracic bristle ×235; *g,* abdominal bristle ×235; *h,* trumpet-shaped abdominal bristle ×315; *i, k,* uncini, front and side view. (*P. coeruleus* Schmarda is very likely but a mere colour variety of *P. triqueter* Linn.). *Pomatostegus polytrema* Philippi: *l,* operculum, enlarged; *m, n,* tube with section ×2; *o,* collar bristle ×315; *p. q,* thoracic bristles ×315; *r, Apomatus* seta from the last thoracic segment ×315; *s,* abdominal trumpet-shaped bristle ×315; *t, u,* uncini, front and side view ×315.

A high collar. Collar setae very fine, short and few. Other thoracic setae winged capillaries. Abdominal setae compressed, trumpet-shaped with a long lateral point.

Uncini pectiniform with lower tooth larger and gouge-like. Tube triangular in section, incrusting the support.

456. **Pomatoceros caeruleus** (Schmarda). (Fig. 245, *a–k*)

Pomatoceros caeruleus Ehlers, 1907, p. 30: Fauvel, 1930a, p. 67.
Pomatoceros strigiceps, Ehlers, 1904, p. 67, pl. IX, figs. 11–19.

Gills, collar and thorax bright indigo-blue. Otherwise hardly distinct from *P. triqueter* Linnaeus. Operculum probably variable, tube less regularly triangular, often coloured blue inside.

Length: 15–25 mm.

Occurrence: Ennur Backwater, Madras Harbour.

Distribution: New Zealand, Australia; Indian Ocean.

Genus **DITRUPA** Berkeley.

Operculum an inverted cone with a horny plate. Pedicle smooth, wingless. A collar. *Collar setae absent.* Thoracic setae capillaries and winged setae. Abdominal setae capillary. Uncini pectiniform, with numerous teeth, the lower one gouged. Tube calcareous, *free*, open at both ends, *Dentalium*-like.

457. **Ditrupa arietina** O. F. Müller. (Fig. 246, *a–g*).

Ditrupa arietina, Saint-Joseph, 1898, p. 443, pl. XXIII, figs. 249–254: Fauvel, 1927a, p. 374, fig. 128, *a–g*; 1932, p. 247.

Operculum vesicular, opercular plate horny, thick, brown, flat or convex, often encrusted. Tube smooth, elephant tusk-shaped, curved and tapering, narrowed at the mouth, white or with brown rings; made of two calcareous layers, the inner opaque white, the outer translucent.

Length: 10–20 mm. by 1–2 mm. Tube, 25–40 mm. by 2–3 mm.

Occurrence: Andaman Sea, 785 fms.

Distribution: Philippine Islands; Andaman Sea, Red Sea; Atlantic Ocean, Mediterranean Sea.

var. **monilifera** Fauvel. (Fig. 246, *h*)

Ditrupa arietina var. *monilifera*, Fauvel, 1932, p. 247, pl. IX, fig. 12.

The tubes show a number of more or less regular annular enlargements, giving them a moniliform appearance.

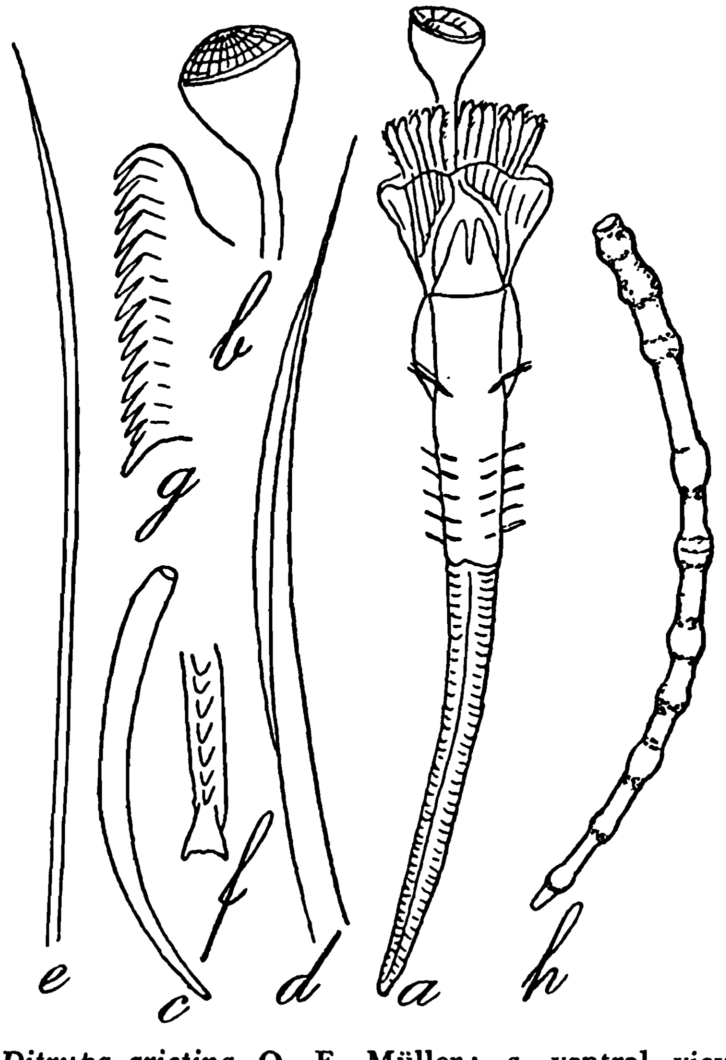

Fig. 246.—*Ditrupa arietina* O. F. Müller: *a*, ventral view ×4; *b*, operculum ×6; *c*, tube, natural size; *d*, thoracic bristle ×220; *e*, abdominal bristle ×100; *f*, *g*, hooks, front and side view ×400; *h*, var. *monilifera* tube ×2.

Occurrence: Andaman Sea, 378 fms.

Distribution: Kei Islands; Andaman Sea.

Genus PROTULA Risso.

Operculum absent. Collar setae simple tapered blades; thoracic setae winged capillaries and *Apomatus* setae; abdominal setae either sickle-shaped or bayonet shaped. Uncini bicuspid, with very numerous, very fine teeth and a long basal spine. Tube white, cylindrical, nearly smooth, often partly erect.

458. Protula tubularia (Montagu) (Fig. 247, *a–i*).

Protula tubularia, Fauvel, 1927a, p. 382, fig. 130.

Protulopsis palliata, Willey, 1905, p. 316, pl. VIII, figs. 183–185.

Abdominal setae sickle-shaped. Collar trilobed. A very large thoracic membrane. Gills woolly. Branchial filaments with red eye-spots at the back. Tube white, nearly smooth, coiled at the base, then erect.

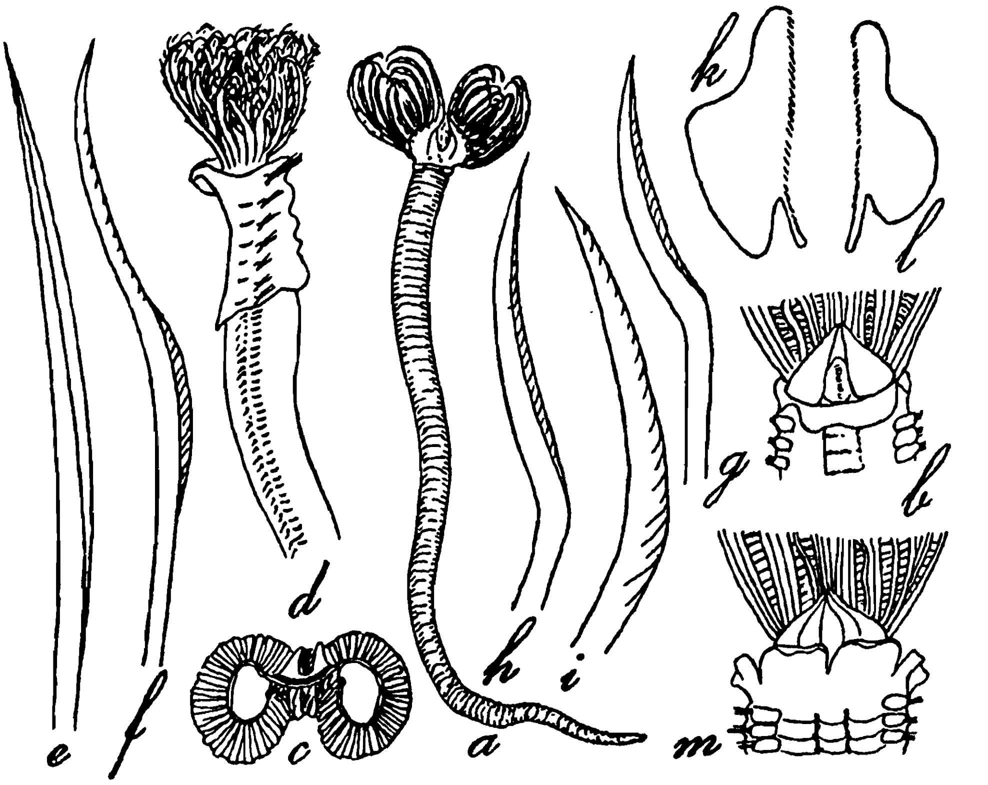

Fig. 247.—*Protula tubularia* (Montagu) : *a,* with its tube (after Quatrefages) ; *b,* anterior region, ventral view (after Rioja) ; *c,* branchial funnel, from above, gills cut off ; *d,* anterior part, side view ×3.5 ; *e,* thoracic winged bristle ×132; *f, Apomatus* seta ×132 ; *g,* abdominal bristle : *h, i,* abdominal bristle before and after treatment with weak potash solution, curve inverted ×220 ; *k, l,* uncini ×350. *Pr. intestinum* (Lamarck) : *m,* anterior part, ventral view (after Rioja).

Length: 20–50 mm. by 3–8 mm.

Colour: Body red or orange, gills with white and red or orange streaks.

Occurrence: Ceylon.

Distribution: Japan, Australia, Malay Archipelago; Indian Ocean, Persian Gulf; Atlantic Ocean, Mediterranean Sea.

Genus FICOPOMATUS Southern.

"Modified setae present on the first thoracic segment, having blades provided with very stout teeth. Beneath the blades is a transverse row of more than two teeth. Uncini with relatively few teeth, the lowest of which is in the form of an elongate bifid spine. Ventral abdominal setae geniculate. Operculum fig-shaped, without any outgrowths" (Southern).

459. **Ficopomatus macrodon** Southern. (Fig. 248, *c—l*)

Ficopomatus macrodon, Southern, 1921, p. 655, pl. XXX, fig. 27, *a—m;* Fauvel, 1932, p. 248.

Operculum soft, vesicular, fig-shaped, flat or convex at the tip, without any outgrowths; stem rather flattened. Branchial filaments 13—17 in number, bearing 18—20 pairs of barbules. 7 thoracic setigerous segments. Collar

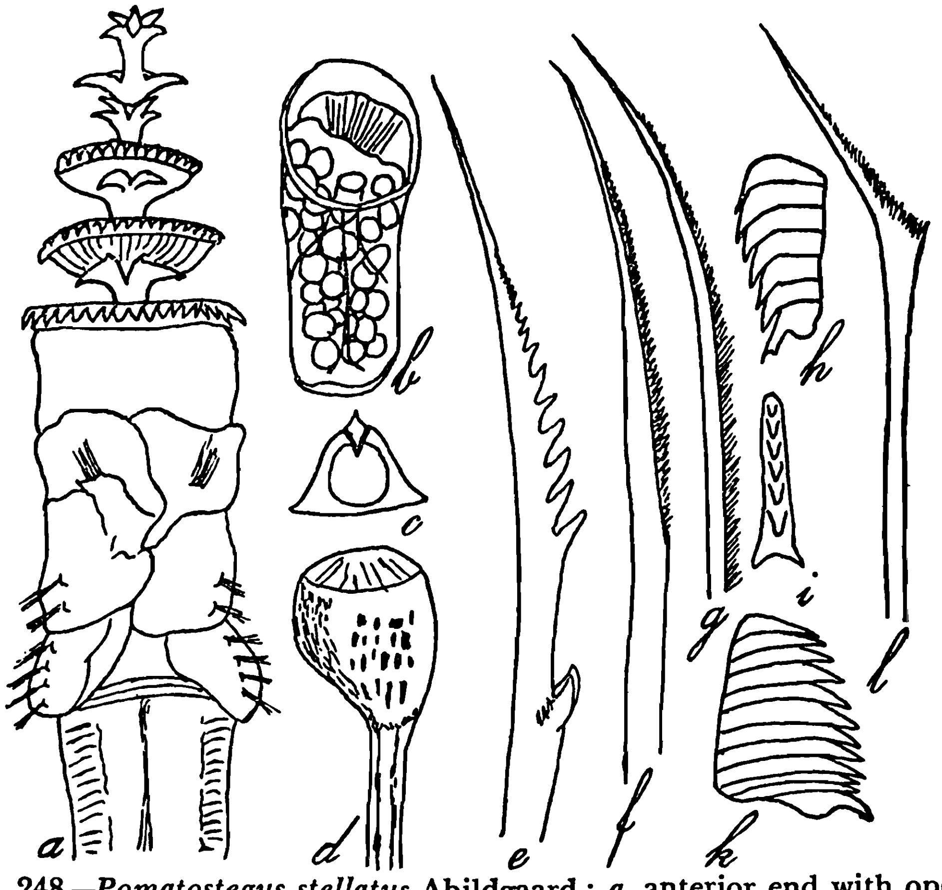

Fig. 248.—*Pomatostegus stellatus* Abildgaard : *a*, anterior end with operculum, dorsal view (after Willey). *Spirorbis foraminosus* Moore : *b*, operculum filled with eggs, front view (after Moore). *Ficopomatus macrodon* Southern ; *c*, front view of the aperture of an attacher tube ; *d*, operculum, side view ×32 ; *e*, modified seta from the first setigerous segment ×400 ; *f*, thoracic capillary bristle ×400 ; *g*, simple capillary seta from the first segment×400 ; *h*, *i*, thoracic hook, front and side view ×640 ; *k*, abdominal hook ×640 ; *l*, ventral abdominal bristle ×440 (after Southern).

high. Free margin of the thoracic membrane entire. Collar setae of two kinds: (1) stout setae with a series of very coarse teeth diminishing in size towards the smooth tip, beneath these teeth for some distance the shaft is smooth and this is followed by a transverse row of teeth; and (2) slender setae with finely tapering tips and minutely hispid edges. Thoracic setae capillary, flattened. Abdominal setae geniculate. Tube free or erect, circular in section, with a single dorsal ridge, or squarish with three dorsal ridges.

Length: 8—10 mm. by 0.5—0.75 mm.

Colour: Traces of blue pigment bands on the gills and thorax.

Occurrence: Taléh-Sap, Gulf of Siam; Sunderbans, Ennur Backwater, Madras Coast, Cochin Backwater, Chepparam.

Genus MERCIERELLA Fauvel.

Operculum non-calcareous, vesicular, crowned with concentric rows of simple *horny spines*. Opercular pedicle smooth, wingless. Branchial filaments without eyes. Interbranchial membrane absent. Collar entire. A thoracic membrane. A pair of palps. Lowest tooth of the uncini stout and *gouged*. Collar setae with *two rows* of sharp teeth. Dorsal thoracic setae winged. Abdominal setae geniculate. Tube circular in section.

460. **Mercierella enigmatica** Fauvel. (Fig. 249, *a—o*)

Mercierella enigmatica, Fauvel, 1923d, p. 124, fig. 1; 1927a, p. 360, fig. 123; 1932, p. 249: Monro, 1924, 155, fig. *a—e*: Rioja, 1924, p. 160, figs. 1—30, pl. V, figs. 1—3.

Seven thoracic segments. Branchial filaments stout, short, with a naked tip variable in length. Interbranchial membrane absent. Operculum somewhat fig-shaped, bearing concentric rows of simple, horny, sharp, blackish spines. Pedicle stout, thick, smooth, subtriangular in section, wingless, with a shallow dorsal groove. Two finger-shaped palps. Collar tall, erect, or turned down, without lateral notches, edges entire; it is continuous with the thoracic membrane which is very broad and terminates in a back flap. Collar setae of two kinds: (1) slender filiform capillaries, and (2) strongly serrated setae with two longitudinal rows of teeth; a few transverse rows at the base and without an intervening smooth part of the shaft. Other dorsal thoracic setae straight, or faintly bent, smooth or very finely hispid. Uncini with a single

row of 5–7 teeth, the lowest of which is larger and *gouged*. Abdominal uncini more triangular, with more numerous teeth. Abdominal setae long, geniculate, serrated. Pygidium conical, with two rounded knobs. Tube calcareous, whitish, thin, cylindrical, wrinkled and bell-shaped at the entrance, the successive peristomes forming collars all along. It is coiled at the base, then erect.

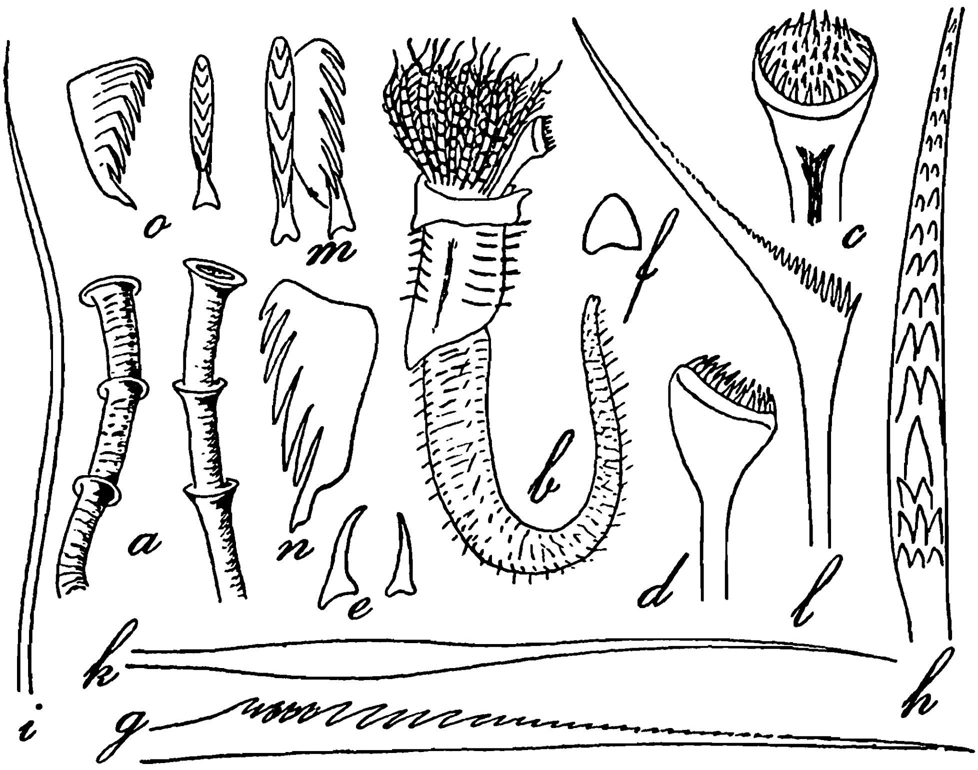

Fig. 249.—*Mercierella enigmatica* Fauvel: *a,* tube ×2.6; *b,* side view ×9; *c, d,* operculum, front and side view ×13; *e,* opercular spines ×52; *f,* section of the opercular stalk; *g, h,* modified bristle of the first setigerous segment, side and front view ×516; *i,* capillary bristle from the first setigerous segment ×344; *k,* thoracic bristle ×344; *m, n,* thoracic uncini, front and side view ×516; *o,* abdominal uncini ×516.

Usually lives in brackish but sometimes in nearly fresh water; very rarely in pure seawater.

Length: 6–25 mm. by 1–2 mm.

Colour: Operculum chestnut, with a white or yellow ring. Gills greenish with brown spots. In spirit, abdomen uncoloured, thoracic tori chestnut, gills ringed with chestnut and chalky white.

Occurrence: Ennur Backwater, on oyster shells.

Distribution: Malay Archipelago, Australia; India; Atlantic Ocean (France, Morocco, Uruguay), Mediter-

ranean Sea, Adriatic Sea, English Channel. In canals, estuaries and on ships' bottoms.

Genus SALMACINA Claparède.

Operculum absent. Branchiae few; more or less enlarged at the tip. Prostomium rounded, with two eyes. A collar. Collar setae notched, with a broad fin-like expansion at the base of the blade. Other thoracic setae

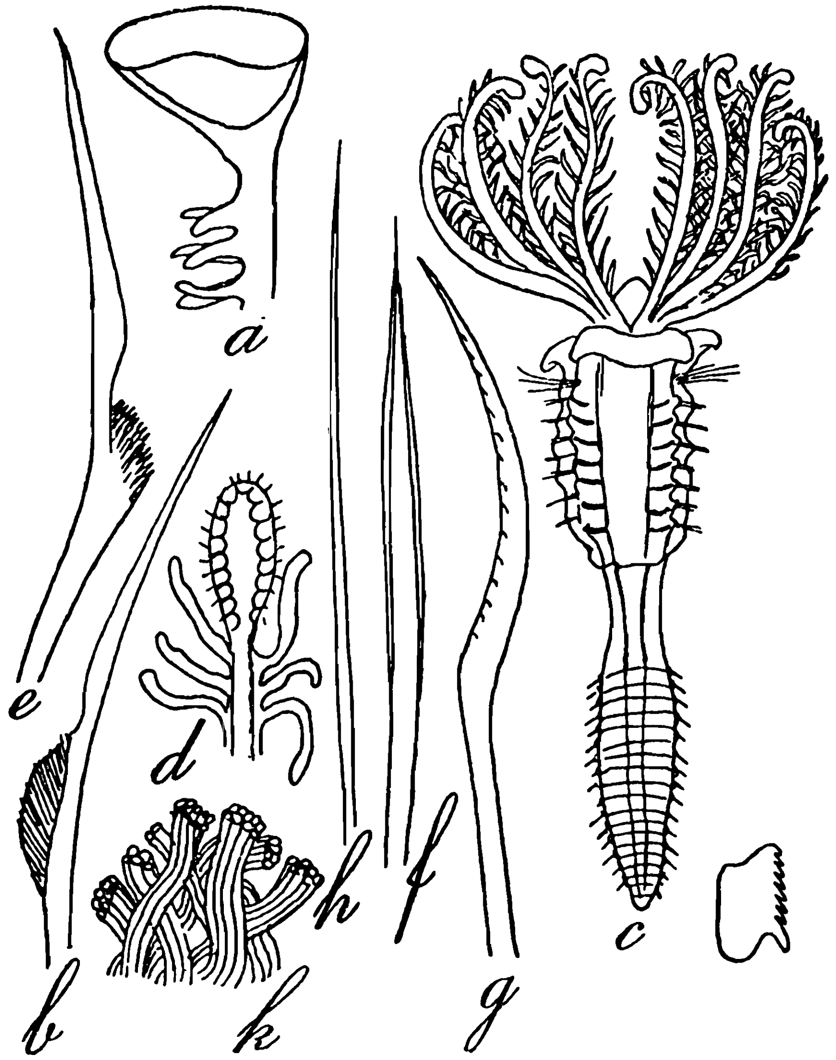

Fig. 250.—*Filograma implexa* Berkeley: *a*, operculum; *b*, collar bristle ×500. *Salmacing dysteri* (Huxley): *c*, ventral view, enlarged; *d*, tip of a gill-radiolle ×40; *e*, collar bristle ×500; *f*, thoracic bristle ×500; *g*, abdominal bristle ×500; *h*, posterior abdominal bristle ×500; *i*, hook ×500; *k*, clustered tubes, natural size.

capillary, limbate, and sickle-shaped setae. Abdominal setae geniculate and serrated. Uncini pectiniform, with the lower tooth larger. Calcareous tubes, very small and slender, crowded in aggregate fenestrated masses. Hermaphrodite. Schiziparous.

461. Salmacina dysteri Huxley. (Fig. 250, *c—k*)

Salmacina dysteri, Fauvel, 1927a, p. 377, fig. 129, *e—k;* 1930a, p. 67.

Branchial filaments with spatulate enlargements at the tips. The triangular wing of the collar setae with numerous, more or less fine, teeth. Tubes forming large, white, colonial masses.

Length: 4—7 mm.

Colour: Orange or red. Gills pale or reddish at the base.

Occurrence: Gulf of Mannar, Krusadai Island, Rameswaram; Madras Harbour.

Distribution: Pacific, Indian and Atlantic Oceans.

Genus SPIRORBIS Daudin.

Body asymmetrical. Thoracic segments less than five. Opercular peduncle without pinnules. Tubes spirally coiled, dextral or sinistral.

462. Spirorbis foraminosus Moore. (Fig. 248, *b*).

Spirorbis foraminosus, Augener, 1926b, p. 472; Fauvel, 1930a, p. 68; 1932, p. 247.

Collar setae smooth, without fin-like extensions, accompanied by a few capillary setae. Abdominal setae with large falciform serrated blades. Operculum cylindrical, transparent, dotted, and crowned with a rim, with longitudinal grated plates. Three thoracic segments. Tube dextral, keeled, wrinkled, more or less pitted with alveoli.

Occurrence: Nankauri Harbour, Nicobar Islands; Gulf of Mannar, Krusadai Island, Rameswaram Beach.

Distribution: Pacific Ocean; Nicobar Islands, Ceylon.

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ALPHABETICAL INDEX

Names in italics are synonyms.

Acoetes magnifica, 72
ACOETINAE, 70
Admetella longipedata, 54
Aglaurides fulgida, 250
Aglaura, 250
Aglaurides *erythroensis,* 250
——*symmetrica,* 250
——*fulgida,* 250
ALCIOPIDAE, 132
Alciopa cantrainii, 134
Alciopina parasitica, 137
Allmaniella ptycholepis, 53
Amage bioculata, 410
Ammochares assimilis, 391
orientalis, 391
AMMOCHARIDAE, 390
Ammotrypane aulogaster, 359
AMPHARETIDAE, 406
Amphicteis gunneri, 407
——*japonica,* 407
——posterobranchiata, 408
Amphictene crassa, 403
AMPHICTENIDAE, 402
Amphinome *djiboutiensis,* 85
——*eucopochaeta,* 83
——*indica,* 83
——*longicirra,* 83
——*macrotricha,* 83
——*maldiviensis,* 85
——*pallasii,* 82
——rostrata, 81
AMPHINOMIDAE, 80
AMPHITRITINAE, 416
Anaitides dissotyla, 119
——madeirensis, 120
——tenuissima, 121
Anaitis zeylanica, 119
Ancistrosyllis constricta, 111
——rigida, 110
Anisoceras, 298
Anisocirrus decipiens, 434
Anthostoma, 310
Aonides cirrata, 315
APHRODITIDAE, 23
Aphrodita aculeata, 24
——australis, 26
——*castanea,* 26
——*haswelli,* 26
——*japonica,* 24
——*longipalpa,* 26
——*talpa,* 26
——*terrae-reginae,* 26
Aphroditella malayana, 26
Aphrogenia alba, 27
——*villosa,* 27
Aponobranchus *perrieri,* 437
Arabella iricolor, 274
——mutans, 275
——*novecrinita,* 275
Aracoda multidentata, 274
——*obscura,* 275
ARENICOLIDAE, 375
Arete, 166
Aricia *chevalieri,* 308
——cuvieri, 301
——persica, 302
——exarmata, 304
——*laevigata,* 310
——nuda, 303
——perpapillata, 301
——persica, 302
ARICIIDAE, 300
Armandia lanceolata, 358
—— leptocirris, 358
Asterope candida, 132
Asychis disparidentata, 387
——gangeticus, 389
——gotoi, 387
——theodori, 386
——trifilosa, 388
Audouinia anchylochaeta, 332
——filigera, 331
——*saxatilis,* 330
——semicincta, 330
Autolytus orientalis, 162
Axiothea campanulata, 383
——*obockensis,* 380
——sp., 381
Axiothella australis, 381
——obockensis, 380

Barantolla sculpta, 370
Benthoscolex coecus, 93
Bhawania cryptocephala, 79
——*myrialepis,* 79
Brada mamillata, 352
——talehsapensis, 351
Branchethus latus, 309
Branchiocapitella singularis, 371
Branchiomma *acrophthalmos,* 444
——*cingulata,* 442
——intermedium, 444
——pacificum, 444
——*quadrioculatum,* 444

CANEPHORINAE, 436
Capithellethus dispar, 371
CAPITELLIDAE, 362
Capitellides dispar, 371
Carobia castanea, 115
Carrazia antennata, 316
——kempi, 317
Cenothrix mutans, 275
Ceratonereis burmensis, 196
——costae, 194
——*falcaria*, 188, 189
——*fasciata*, 195
——flagellipes, 199
——*lapinigensis*, 195
——microcephala, 198
——mirabilis, 200
——pachychaeta, 196
——*pectinifera*, 195
——*tentaculata*, 201
——tripartita, 197
Ceratocephale, 165
CHAETOPTERIDAE, 336
Chaetopterus *appendiculatus*, 337
——*cautus*, 337
——*longimanus*, 338
——*longipes*, 338
——variopedatus, 337
CHLORAEMIDAE, 344
Chloeia amphora, 96
——*capillata*, 96
——*ceylonica*, 96
——flava, 96
——fusca, 97
——*incerta*, 96
——*longisetosa*, 97
——*merguiensis*, 96
——parva, 96
——rosea, 97
——*tumida*, 96
——violacea, 95
CHRYSOPETALIDAE, 78
Chrysopetalum ehlersi, 78
CIRRATULIDAE, 329
Cirratulus *anchylochaetus*, 332
——cirratus, 334
——chrysoderma, 333
——*complanatus*, 333
——*cylindricus*, 331
——dasylophius, 333
——filiformis, 333
——*semicinctus*, 330
Cirrosyllis incerta, 279
——*zealanica*, 163
Cistenides antipoda, 403
Clymene annadalei, 377
——gracilis, 380
——grossa, 378
——*harai*, 383
——insecta, 377
——*monilis*, 379
——santanderensis, 379
——watsoni, 379
Clymenella insecta, 377
Corynocephalus albomaculatus, 137
Cymospira gaymardi, 462

Dasybranchus caducus, 365
——*cirratus*, 365
——*giganteus*, 365
Dasychone cingulata, 442
——serratibranchis, 442
Dendronereis aestuarina, 173
——arborifera, 172
Dendronereides heteropoda, 174
Diopatra *amboinensis*, 252
——*malabarensis*, 281
——neapolitana, 252
——*phyllocirra*, 252, 281
——*variabilis*, 252
Disoma orissae, 327
DISOMIDAE, 327
Diplocirrus glaucus, 353
Ditrupa arietina, 470
——monilifera, 470
Dodecaceria fistulicola, 335
——*joubini*, 335
——*opulens*, 335
Dorvillea gardineri, 280
Drieschia pelagica, 54
Drilonereis filum, 276
——macrocephala, 276
——major, 277

Ehlersia cornuta, 153
——*sexoculata*, 153
Eryphile, 231
ERRANTIA, 23
Eteone barantollae, 127
——ornata, 128
Euclymene annandalei, 377
——grossa, 378
——insecta, 377
——santanderensis, 379
——watsoni, 379
Eugrymaea, 432
Eulalia albopicta, 123
——magalhaensis, 124
——*pallida*, 125
——sanguinea, 125
——*tenax*, 124
——viridis, 122

Eumida *communis,* 125
—— sanguinea, 125
Eunice afra, 235
—— *amphiheliae,* 235
—— antennata, 240
—— aphroditois, 233
Eunice australis, 240
—— coccinea, 236
—— *elseyi,* 234
—— floridana, 235
—— *gigantea,* 233
—— gracilis, 243
—— grubei, 237
—— *gunneri,* 235
—— indica, 241
—— investigatoris, 239
—— *leucodon,* 241
—— marenzelleri, 242
—— *martensi,* 234
—— *micropion,* 237
—— *murrayi,* 240
—— *paupera,* 236
—— *philocorallia,* 235
—— *pycnobranchiata,* 234
—— *roussaei,* 233
—— savignyi, 238
—— siciliensis, 241
—— *stragulum,* 247
—— tentaculata, 234
—— *teretiuscula,* 280
—— tubifex, 232
EUNICIDAE, 228
EUNICINAE, 229, 230
Eunoë pallida, 39
Eupanthalis edriophthalma, 76
Euphione tenuisetosa, 36
Euphrosyne *ceylonica,* 101
—— foliosa, 102
—— *laureata,* 102
—— myrtosa, 101
Eupomatus albiceps, 460
—— *elegans,* 458
—— exaltatus, 458
—— heteroceros, 459
—— lunulifera, 458
—— minax, 460
Eupompe australiensis, 73
—— *indica,* 71
Eurato notata, 445
—— *porifera,* 439
—— *sancti-josephi,* 445
Eurythoë *alcyonia,* 83
—— complanata, 83
—— *heterotricha,* 85
—— *karachiensis,* 83
—— *latissima,* 83
—— *laevisetis,* 83
—— *matthaei,* 84
—— *pacifica,* 83
—— parvecaruncuIata, 85
Eusigalion stylolepis, 66
Eusyllis ceylonica, 159
Euthalanessa djiboutiensis, 64
Exogone spec., 163

Flabelligera diplochaitos, 344
Ficopomatus macrodon, 473

Gattyana deludens, 39
—— *pallida,* 39
Gastrolepidia *ambyphyllus,* 51
—— clavigera, 51
Genetyllis castanea, 115
Glycera alba, 292
—— *cinnamonea,* 292
—— cirrata, 297
—— *cochinensis,* 292
—— *decipiens,* 297
—— gigantea, 296
—— *goesi,* 297
—— lancadivae, 291
—— longipinnis, 291
—— manorae, 298
—— prashadi, 294
—— *nicobarica,* 297
—— rouxii, 297
—— sagittariae, 295
—— *siphonostoma,* 296
—— tesselata, 291
GLYCERIDAE, 281
CLYCERINAE, 289
Glycinde oligodon, 288
Goniada agnesiae, 287
—— annulata, 283
—— *australensis,* 283
—— *echinulata,* 283
—— emerita, 282
—— eximia, 285
—— incerta, 286
—— *japonica,* 283
—— *longicirrata,* 283
GONIADINAE, 281
Goniadopsis agnesiae, 287
—— incerta, 286
Greeffia celox, 135
—— *bahuensis,* 135
Grymaea cespitosa, 433
—— *persica,* 432

Halla, 230
Halosydna fulvovittata, 52
—— *ceylonica,* 50
—— *striata,* 52

Haplobranchus, 452
Haplosyllis spongicola, 147
Harmothoë ampullifera, 43
—— arabica, 46
—— boholensis, 47
—— dictyophora, 44
—— *holothuricola,* 39
—— imbricata, 42
—— indica, 47
—— iphionelloides, 41
—— minuta, 45
—— *pallida,* 39
—— sinagawensis, 48
Hemipodus, 290
Hermenia acantholepis, 38
Hermione hystrix, 28
—— *malleata,* 28
Hermella bicornis,
HERMELLIDAE, 393
HERMIONINAE, 28
Hesione *ceylonica,* 104
—— *ehlersi,* 104
—— *eugeniae,* 104
—— genetta, 105
—— intertexta, 105
—— pantherina, 104
—— *splendida,* 104
HESIONIDAE, 103
Heterocirrus typhlops, 334
Heteromastides bifidus, 368
Heteromastus similis, 366
Hololepidella commensalis, 59
Hyalinoecia *camiguina,* 261
—— tubicola, 261
Hyperhalosydna striata, 52
Hydroides albiceps, 460
Hydroides exaltatus, 461
—— heteroceros, 459
—— homoceros, 458
—— lunulifera, 458
—— minax, 460
—— monoceros, 460
—— *multispinosa,* 458
—— norvegica, 458
—— perezi, 457
—— *uncinata,* 459
—— vesiculosus, 461
Hypsicomus *marenzelleri,* 447
—— phaeotaenia, 447
—— *pigmentatus,* 447

Idanthyrsus pennatus, 398
Ilyphagus hirsutus, 354
Iphione muricata, 32
—— *spinosa,* 32
Iphionella cimex, 43
Iphitime, 230
Irma angustifrons, 109
—— *latifrons,* 110
—— *limicola,* 109

Jasmineira caducibranchiata, 451
Johnstonella aloysi-sabaudiae 144
—— ducii, 143
—— dunkeri, 145
—— helgolandica, 143
—— rolasi, 143

Kynephorus inermis, 110

Labrorostratus, 230
LACYDONINAE, 114
Laetmatonice benthaliana, 29
—— producta, 29
Lagisca flaccida, 41
—— *indica,* 47
—— *minuta,* 45
Lanice socialis, 418
Lagis abranchiata, 405
Laonice cirrata, 315
Laonome indica, 446
Leanira japonica, 69
—— *sibogae,* 69
Leocrates *chinensis,* 106
—— claparedii, 106
—— diplognathus, 107
—— *giardi,* 106
—— *iris,* 106
Leocratides ehlersi, 107
Leodice, 231
Leonnates jousseaumei, 169
—— decipiens, 171
—— *indicus,*
Lepidasthenia maculata, 58
—— microlepis, 57
Lepidonotus acantholepis, 38
Lepidonotus *ampulliferus,* 44
—— carinulatus, 34
—— cristatus, 35
—— dictyolepis, 35
—— *fusicirrus,* 38
—— hedleyi, 35
—— *indicus,* 47
—— jacksoni, 34
—— jukesi, 37
—— melanogrammus, 37
—— *oculatus,* 35
—— *striatus,* 52
—— tenuisetosus, 36
—— *trissochaetus,* 37
—— *willeyi,* 34
Leprea ehrenbergi, 421
—— *inversa,* 421

Loimia *annulifilis,* 416
—— *crassifilis,* 416
—— medusa, 416
—— *montagui,* 416
—— *variegata,* 416
LOPADORHYNCHINAE, 114
Lopadorhynchus uncinatus, 130
LUMBRICONEREINAE, 229, 263
Lumbriconereis bifilaris, 269
—— *erecta,* 268
—— heteropoda, 268
—— *indica,* 281
—— impatiens, 267
—— *japonica,* 266
—— latreilli, 266
—— notocirrata, 271
—— *obtusa,* 267
—— polydesma, 264
—— pseudobifilaris, 269
—— simplex, 264
—— sphaerocephala, 267
Lycastis indica, 167
—— meraukensis, 166
Lycoris heteromorpha, 193
—— *nuntia,* 213
—— *quatrefagesi,* 215
Lygdamis indicus, 399
—— *muratus,* 399
—— porrectus, 400
LYSARETINAE, 229
Lysidice collaris, 248
—— *fallax,* 248
—— ninetta, 248
—— *sulcata,* 248
Lysilla pambanensis, 435

Maclovia,
Macroclymene monilis, 379
Macrophyllum splendeus, 126
Magelona obockensis, 329
Magelona rosea, 329
Magelona sp., 329
MAGELONIDAE, 329
Maldane *coronata,* 387
—— sarsi, 382
—— *gotoi,* 387
—— *disparidentata,* 387
—— *cristata,* 382
—— *cristagalli,* 385
Maldanella harai, 383
MALDANIDAE, 375
Manayunkia spongicola, 452
Marphysa *chevalensis,* 247
—— *corallina,*
—— fallax, 247
—— *furcellata,* 245
—— gravelyi, 246
—— mcintoshi, 246
—— mossambica, 246
—— sanguinea, 245
—— stragulum, 247
Mastigonereis longicirra, 215
Mastobranchus indicus, 369
Megalomma pacificum, 444
Melinna aberrans, 413
—— *dubita,* 412
Melinopsis dubita, 412
Mercierella enigmatica, 474
Mesochaetopterus minutus, 342
Myriochele heeri, 392
—— picta, 392
Mysta *maculata,* 128
—— ornata, 128
Naidonereis, 310
Nainereis laevigata, 310
Nauphanta celox, 135
—— *novae-hollandiae,* 246

Neanthes *albanyensis,* 193
—— capensis, 193
—— *latipalpa,* 215
—— meggitti, 194
—— *nuntia,* 213
Nectochaeta caroli, 54
—— grimaldii, 56
Nematonereis unicornis, 249
Neottis gracilis, 437
NEPHTHYDIDAE, 223
Nephthys dibranchis, 225
—— *dussumieri,* 228
—— gravieri, 226
—— inermis, 224
—— malmgreni, 226
—— oligobranchia, 228
—— polybranchia, 227
—— *spiribranchis,* 225
NEREIDAE, 163
Nereilepas brevicirris, 214
Nereis abnormis, 222
—— anchylochaeta, 177
—— *arenaceodentata,* 180
—— *burmensis,* 196
—— capensis, 193
—— *cavifrons,* 210
—— chilkaensis, 185
—— chingrighattensis, 179
—— *coenocirrus,* 178
—— costae, 194
—— coutierei, 187
—— cricognatha, 180
—— *denhamensis,* 189
—— *ehlersiana,* 223

——ezoensis, 186
——*falcaria,* 188
——*fasciata,* 195
——*festiva,* 223
—— flagellipes, 199
—— *foliosa,* 223
——fusoo-rubida, 219
——gisserana, 190
——glandicincta, 181
——*heirissonensis,* 189
——heteromorpha, 193
——indica, 186
——jacksoni, 189
——kauderni, 188
——*languida,* 205
——*lapinigensis,* 195
——*longicirra,* 215
——longilingulis, 192
——meggitti, 194
——microcephala, 198
——*microdonta,* 214
——mirabilis, 200
——*mortenseni,* 188
——nuntia, 212
——onychophora, 178
——pachychaeta, 196
——reducta, 190
——spec., 223
——talehsapensis, 184
——trifasciata, 183
——tripartita, 197
——unifasciata, 182, 183
——*vallata,* 215
——*vancaurica,* 205
——zonata-persica, 187
Nerine cirratulus, 312
Nicidion gracilis, 243
Nicolea gracilibranchis, 420
Nicomache truncata, 390
Ninoë chilensis, 277
Notocirrus trigonocephalus, 281
Notomastus giganteus, 365
——latericeus, 364
——*zeylanicus,* 364, 371
Notophyllum *imbricatum,* 126
——*laciniatum,* 126
——*multicirris,* 126
——splendens, 126
Notopygos gigas, 98
——hispidus, 100
——labiatus, 99
——variabilis, 100

Odontosyllis gravelyi, 160
——rubrofasciata, 160
Oenone fulgida, 250
Oligognathus, 230
Omphalopoma langerhansi, 468
Omphalopomopsis langerhansi, 468
Oncoscolex microchaetus, 357
ONUPHIDINAE, 229, 251
Onuphis aucklandensis, 257
——basipicta, 258
——conchylega, 255
——dibranchiata, 254
——eremita, 257
——furcatosetosa, 254
——holobranchiata, 256
——investigatoris, 258
——*landanaensis,* 258
——*tenuisetis,* 257
——*tubicola,* 261
OPHELIIDAE, 357
Ophelina leptocirris, 358
Ophryotrocha, 230
Opisthosyllis australis, 156
——brunnea, 155
——longicirrata, 154
Owenia fusiformis, 391
OWENIIDAE, 390

Pallasia *chrysocephala,* 400
——indica, 399
——*laevispinis,* 399
——*murata,* 399
——pennata, 398
——porrecta, 400
Panthalis *bicolor,* 71
——*edriophthalma,* 76
——*jogasimae,* 75
——*lacazei,* 71
——*marenzelleri,* 75
——*melanonotus,* 72
——*nigromaculatus,* 76
——oerstedi, 74
Paraheteromastus tenuis, 369
Paralacydonia *mortenseni,* 129
——weberi, 129
Paralepidonotus *ampulliferus,* 44
——*boholensis,* 47
Paramarphysa orientalis, 247
Paramphinome indica, 91
Paranereis elegans, 215
Parasphaerosyllis indica, 162
Paraprionospio pinnata, 323
——*tribranchiata,* 323
Parascierocheilus branchiatus, 356
Pectinaria abranchiata, 405
——antipoda, 403
——capensis, 406
——crassa, 403
——panava, 406

Pelagobia longicirrata, 131
Pelogenia antipoda, 67
Perinereis aibuhitensis, 209
——barbara, 204
——brevicirris, 214
——*camiguina,* 206
——cavifrons, 210
——cultrifera, 206
——floridana, 206
——*helleri,* 206
——heterodonta, 214
——*horsti,* 205
——maindroni, 203
——*marjorii,* 210
——*mictodonta,* 214
——*nankaurica,* 205
——neocaledonica, 211
——nigro-punctata, 210
——nuntia, 212
——*obfuscata,* 206
——*perspicillata,* 206
——singaporiensis, 205
——*striolata,* 206
——suluana, 204
——vancaurica, 205
——*yorkensis,* 240
Petaloproctus terricola, 385
Petta, 402
Phenacia exilis, 433
Phyllochaetopterus aciculigerus, 341
——elioti, 340
——gardineri, 341
——herdmani, 342
——*pictus,* 339
——spec.,
——*ramosus,* 339
——socialis, 339
Phyllodoce castanea, 115
——dissotyla, 119
——*foliosopapillata,* 120
——fristedti, 118
——gracilis, 117
——*macrolepidota,* 118, 121
——madeirensis, 120
——malmgreni, 117
——*multicirris,* 126
——quadraticeps, 116
——*sancti-josephi,* 120
——*sancti-vincentis,* 120
——tenuissima, 121
——zeylanica, 119
PHYLLODOCIDAE, 114
PHYLLODOCINAE, 115
Physelia fasciata, 425
——*viridis,* 437
Pionosyllis spec., 163
Pisione *contracta,* 77
——oerstedi, 77
PISIONIDAE, 76
Pista fasciata, 425
——herpini, 427
——indica, 422
——macrolobata, 426
——pachybranchiata, 428
——robustiseta, 424
——typha, 424
Platynereis abnormis, 222
——*bengalensis,* 218
——dumerilii, 218
——fusco-rubida, 219
——*insolita,* 218
——*integer,* 221
——pulchella, 220
——polyscalma, 221
Pleione tetraedra, 82
Plotobia simplex, 139
Podarke angustifrons, 109
——*didymocera,* 109
——latifrons, 110
Polydora antennata, 316
——armata, 321
——ciliata, 319
——coeca, 319
——flava, 321
——hornelli, 318
——kempi, 317
Polydorella prolifera, 322
POLYCIRRINAE, 434
Polycirrus coccineus, 434
Polymnia labiata, 437
——nebulosa, 419
——socialis, 418
——*trigonostoma,* 419
——*triplicata,* 419
Polynoë ampullifera, 43
——*boholensis,* 47
——*crinoidicola,* 50
——*dictyophora,* 44
——*fulvovittata,* 52
——*fusicirra,* 38
——*longicirra,* 50
——*minuta,* 45
——*platycirris,* 52
——*ptycholepis,* 53
POLYNOINAE, 31
Polyodontes *aculea,* 71
——maxillosus, 71
——melanonotus, 72
——*oculea,* 71
——*sibogae,* 72
Polyophthalmus *australis,* 360
——*ceylonensis,* 360
——*collaris,* 360
——pictus, 360
——*setasus,* 360

Pomatoceropsis coutierei, 462
——*jousseaumei,* 464
Pomatoceros coeruleus, 470
——*strigiceps,* 470
——triqueter, 469
Pomatoleios crosslandi, 461
Pomatostegus *actinoceros,* 465
——polytrema, 465
——stellatus, 465
Pontogenia chrysocoma, 30
——indica, 29
——nuda, 30
Potamilla ceylonica, 449
——ehlersi, 449
——leptochaeta, 449
——*oligophthalmos,* 449
Praxillella gracilis, 380
——*insecta,* 377
Prionognathus, 278
Prionospio *africana,* 323
——*alata,* 323
——cirrifera, 324
——krusadensis, 326
——*multibranchiata,* 324
——pinnata, 323
——polybranchiata, 324
Protula intestinum, 472
——tubularia, 472
Protulopsis palliata, 472
Psammolyce antipoda, 67
——fijiensis, 67
——*rigida,* 67, 68
——zeylanica, 68
——magalhaensis, 124
Pseudeurythoë acarunculata, 89
——ambigua, 90
——microcephala, 88
——paucibranchiata, 86
Pseudonereis anomala, 217
——*ferox,* 215
——gallapagensis, 215
——rottnestiana, 217
——*variegata,* 215
Pterocirrus brevicornis, 125
Pterocirrus ceylonicus, 125
Pulliella armata, 374

Rhamphobrachium chuni, 261
——diversosetosum, 262
Rhynchonerella fulgens, 138
Sabella *bipunctata,* 439
——*fusca,* 439
——*fuscotaeniata,* 447
——*guinensis,* 439
——*melanochlora,* 445
——melanostigma, 439
——*phaeotaenia,* 447
——porifera, 439
——*pottaei,* 445

Sabellaria *alcocki,* 394
——*bicornis,* 398
——cementarium, 395
——intermedia, 397
——laevispinis, 399
——pectinata, 396
——spinulosa, 394
SABELLARIIDAE, 393
Sabellastarte indica, 445
SABELLIDAE, 437
Sacconereis sp., 163
Salmacina dysteri, 477
Samytha *bioculata,* 410
Scalibregma inflatum, 355
SCALIBRAEGMIDAE, 354
Scalisetosus longicirrus, 50
——pellucidus, 49
Schistocomus hiltoni, 411
Scolelepis indica, 313
Scoloplos armiger,
——chevalieri, 308
——*hexaphyllum,* 310
——kerguelensis, 307
——latus, 309
——marsupialis, 306
Scyphoproctus djiboutiensis, 373
SEDENTARIA, 300
Serpula granulosa, 455
——*minax,* 460
——vermicularis, 454
——watsoni, 456
SERPULIDAE, 452
SIGALIONINAE, 60
Sphaerodoce quadraticeps, 116
Spiochaetopterus spec., 342
SPIONIDAE, 311
Spionides japonicus, 315
SPIONIFORMIA, 16
Spirobranchus acroceros,
——*cervicornis,* 462
——giganteus, 462
——jousseaumei, 464
——maldivensis, 464
——*multicornis,* 462
——*semperi,* 462
——*tetraceros,* 462
——*tricornigerus,* 462
——turbnatus,
Spirographis spallanzani, 441
——*tricyclia,* 441
Spirorbis foraminosus, 477
STAUROCEPHALINAE, 229, 278

Staurocephalus *australis,* 279
——incertus, 279
——gardineri, 280
Stauronereis australis, 279
——*incerta,* 279
Sternaspididae, 401
Sternaspis *costata,* 402
——*fossor,* 402
Steggoa brevicornis, 125
——*magalhaensis,* 124
STERNASPIDIDAE, 401
Sthenelais boa, 61
——calcarea, 64
——*idunae,* 62
——*orientalis,* 62
——variabilis, 62
——zeylanica, 62
Sthenolepis japonica, 69
Streblosoma cespitosa, 433
——persica, 432
Stylarioides bengalensis, 347
——bifidus, 349
——eruca, 347
Stylarioides hamocarens, 345
——indica, 347
——*iris,* 346
——parmatus, 346
SYLLIDAE, 145
SYLLINAE, 146
Syllis *brachychæta,* 150
——closterobranchia, 150
——*compacta,* 148
——cornuta, 153
——djiboutiensis, 147
——exilis, 151
——*gigantea,* 158
——gracilis, 147
——*hamata,* 147
——*hyalina,* 150
——krohnii, 150
——*longissima,* 147
——okadai, 152
——prolifera, 149
——*solida,* 151
——spec., 160
——spongicola, 147
——*vancaurica,*
——variegata, 148

Talehsapia annadalei, 113
Terebella ehrenbergi, 421
——*fasciata,* 425
——*gracilibranchis,*
——*typha,* 424
TEREBELLIDAE, 415
Terebellides *intoshi,* 437
Terebellides *sieboldi,* 437
——stroemi, 436
——*ypsilon,* 436
Tetreres laevispinis, 390
Thalanessa digitata, 66
Thalanessa djiboutiensis, 64
——*styolepis,* 66
Tharyx multifilis, 334
THELEPINAE, 430
Thelepus cincinnatus, 431
——*crispus,* 430
——japonicus, 430
——plagiostoma, 430
——*rugosus,* 430
——setosus,
Theodisca anserina, 370
——*hexaphyllum,* 310
Thormora jukesi, 37
Timarete ancylochaeta, 332
——*fecunda,* 332
TOMOPTERIDAE, 140
Tomopteris aloysi-sabaudiae, 144
——*catharina,* 143
Tomopteris cavallii, 141
——ducii, 143
——dunkeri, 145
——elegans, 142
——helgolandica, 140
——*kefersteini,* 142
——mortenseni, 141
——planctonis, 142
——rolasi, 143
Tradopia maculata, 281
Travisia arborifera, 361
Travisiopsis lobifera, 139
Trophonia glauca, 353
Trypanosyllis gigantea, 158
——misakiensis, 158
——*richardi,* 157
——zebra, 157
Tylonereis bogoyawlenskyi, 168
——fauveli, 169
Tylorhynchus
TYPHLOSCOLECIDAE, 139
Typosyllis closterobranchiata, 150
——exilis, 151
——krohnii, 150
Typosyllis okadai, 152
——prolifera, 149
——*tapobranensis,* 159
——variegata, 148
Vanadis formosa, 135
Vermilia pygidialis, 466
Vermiliopsis acanthophora, 467
——glandigera, 467
——pygidialis, 466

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